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AMERICAN GAS JOURNAL

JULY 1940

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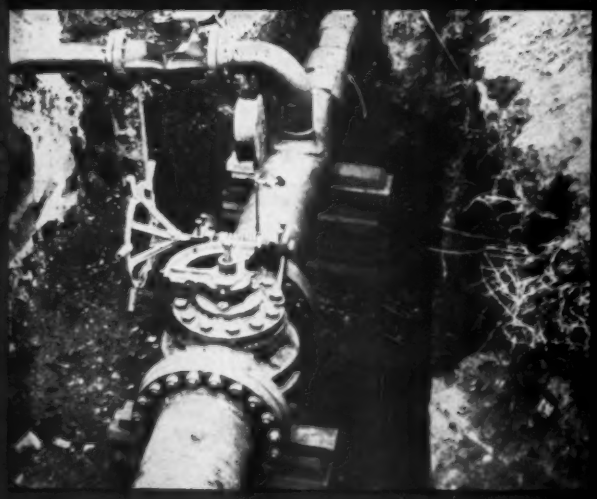

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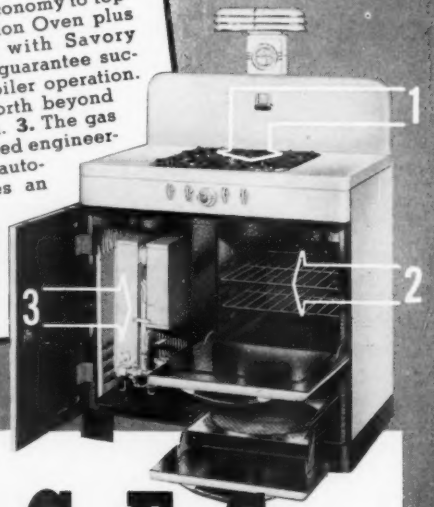

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JULY
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AMERICAN
GAS JOURNAL

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Gas For All Four

In Large De Luxe Apartment Hotel

By
Fred A. Herr
Los Angeles Calif.

The Shangri-La Apartment Hotel at Santa Monica, Calif. This ultra-modern structure, the first major apartment house project erected in the Los Angeles metropolitan area since 1929, uses gas exclusively for room heating, bathroom heating, water heating, cooking and refrigeration.

THE SHANGRI-LA Apartment Hotel, Ocean and Arizona Aves., Santa Monica, Calif., a $400,000 seven-story deluxe structure of distinctive design and arrangement, uses gas exclusively for room heating, bathroom heating, cooking, water heating and refrigeration.

Choice of gas for operating those services was decided upon by the sponsors of the building after a protracted research had been made concerning the practicability and serviceability of other mediums and systems.

The Shangri-La is the first Class A apartment house of its size erected in Southern California within the past 11 years. The project was financed by the Tulsa-Santa Monica Corp., which is headed by P. A. Gillespie, member of the firm of F. A. Gillespie and Sons Co. of Tulsa, Okla., whose oil operations embrace fields in Oklahoma, Texas and Kansas. Designed by William E. Foster, Beverly Hills, Calif., architect, the Shangri-La is keyed in every detail and appointment to the requirements of those who seek the higher type of residential facilities. It incorporates modernistic features of design and construction never before attempted in west coast apartment-hotel planning. The name was taken from "Shangri-La," the name of a fabled mountain retreat in James Hilton's novel "Lost Horizon."

The building is of concrete and steel. The exterior design is modern with a classic note. The Arizona Street side is placed at an angle to permit all apartments on that side to have a permanent view of the Pacific Ocean, which lies just beyond Ocean Avenue and an intervening palisades park. As the sea view is an emphasized feature, windows have been made exceptionally large, which affects the whole exterior appearance. The two upper floors are set back to form roof decks to serve as porches to apartment dwellers in those levels and tend to soften the outline of the building against the sky.

The rear of the L-shaped structure looks out over a landscaped patio, 8,000 feet in area, which is built above an underground garage. The rear, as seen from the patio, is of striking design. Open galleries at every floor give access to all apartments and take the place of the customary interior corridors. This design made possible apartments with windows at both front and rear. It also supplies a through draft across every apartment for the uninterrupted sweep of ocean breezes in hot weather. All apartments have been planned so that living rooms and bedrooms are on the side facing the ocean, and only kitchens and bathrooms on the patio side.

This design of exterior galleries and no inside hallways is regarded as unique in western America. Architect Foster pointed out that although there are buildings in Europe and South America that suggest the Shangri-La because of their modern treatments, there is no other building like it in planning and arrangement.

Construction throughout is of concrete and steel. No wood is used except for doors, door frames and shelving. Glass brick is employed to advantage in the lobby, from which open offices, reception rooms and elevators. Eight-inch concrete walls run across the building between each apartment and serve the double purpose of forming earth-

quake resisting beams and also preventing any sound from passing through the walls between apartments.

A 150 foot garage, with storage space for one car for each of the 63 apartments, extends under the building and patio.

Heating System

In planning the heating system for the building consideration was given the fact that temperature along the southern California coast shows considerable variation, even in 24 hour periods. Warm days are followed by cool evenings, and even after sunset in summer a certain amount of heat is desirable to drive away the chill. This condition is more pronounced in cities like Santa Monica, which lies directly on the sea shore. For that reason the heating of the Shangri-La posed a distinct problem. It was found that for single-story dwellings floor furnaces would provide ample heat because the overcapacity of the average floor furnace affords quick and adequate results, which, within a few minutes, will raise the room temperature to the comfort zone. However, because of the many-story character of the Shangri-La and the set-back design of the upper floors, floor furnaces were eliminated from consideration. The installation of such a system, it was believed, would prove too complicated and costly.

Other types of heating were discarded for various plausible reasons. According to Manager C. D. Green, the designers felt that the unvented type of wall heater would not be looked upon with favor by the class of clientele to whom the owners planned to cater. Individual unit heaters, on the other hand, would have required more space than the plans allowed for; and a steam or hot water system for room heating, the predominant heating system for Class A structures, would not provide the type of comfort the owners wished to assure the guests of the Shangri-La.

Owner Gillespie, Manager Green and Architect Foster proceeded on the theory that steam or hot water is most satisfactory in climates where temperature remains consistently cool and it is necessary to maintain heat throughout the day. They pointed out that in Southern California it would be impractical to spend four or five hours in building up steam when the heat might only be required for a short period of time in the evening. They emphasized, also, that when heat *is* required in Southern California coastal cities, it is desired more quickly and in greater volume than steam or hot water can supply.

In planning the heating system for the Shangri-La Apartment Hotel the variation in temperature requirements of guests was likewise considered. Elderly persons, admittedly, often wish temperatures running up to 82 and 85 deg. F. Young people, however, might feel no need for heat at all. Hence, a heating system was sought which would provide control of temperatures in each apartment to the degree favored by the occupants.

The room heating system ultimately decided upon consists of individual, thermostatically controlled gas wall units in each apartment, supplemented by a central gas-fired, low pressure steam boiler set-up in the basement for supplying hot water and heat to the bathrooms in all apartments independent of the wall-heating units in other rooms.

Front-view cut-away shows interior of wall unit immediately behind air intake grille. The burner is specially designed with raised burner ports to permit adequate introduction of secondary air to complete combustion. Each unit is equipped with a safety valve and pilot combination attachment that shuts off gas completely if the pilot is out.

All of the 58 apartments on the first five floors are heated by Andrews two-way gas wall units, built and installed by the Andrews Heater Co., 1750 West Jefferson Blvd., Los Angeles. Fully vented and embracing all features of a floor furnace, they were chosen because of their adaptability to installation in the walls between partitions.

The units are 52½ inches high, 28½ inches wide, with a body depth of 9¼ inches, flue diameter of 4 inches and grille size of 10½ by 22 inches. They have a 36,000 B.t.u. input and 25,200 B.t.u. output per hour. The over-rate capacity of each unit is designed to heat 4,000 cubic feet of room area, whereas the typical room in the Shangri-La is 13 by 14 feet with a 10 foot ceiling height, for a total of 1,820 cubic feet. Manually controlled by a four-stage valve, each unit indicates on a dial exactly the height of the fire—high, medium, low or off—permitting adjustment to any desired temperature.

Each heater has a thermostat installed at the cold-air intake which cuts off the gas when the room temperature is normal. At the Shangri-La the thermostats are adjusted to cut off the gas at 75 deg. F., in the average apartment, but can be adjusted by the management to meet the desires of a particular tenant. From the owner standpoint, Manager Green asserted, this thermostatic control is desirable, particularly in buildings where utilities are supplied by the building operator. It protects the management against the objectionable practice of tenants turning on the gas and leaving the apartment for a considerable period of time. As installed in the Shangri-La, the thermostats cannot be tampered with by tenants.

The adoption of this type of gas heater required special provisions in the building plans in that the units required a slightly wider partition where installed. They are mounted between the studding and after venting were plastered in so that only the louvre-type grilles are visible in the rooms. The unit is securely insulated with two inches of rock wool, compressed to one inch thickness, on both sides, between two sheets of heavy metal, assuring insulation against heating the walls.

Five somewhat more elaborate apartments on the set-back sixth floor and the two pent houses on the roof are heated by special Fraser and Johnson forced air gas-fired wall units. They supply warm, filtered air under automatic control and maintain even temperature as desired by the individual apartment dwellers. In summer these units may be used to circulate cool air through the rooms.

Bath Room Heating

The separate bathroom heating system (original with the Shangri-La among Southern California

apartment hotels) is the outgrowth of Mr. Green's conviction that the bathroom in homes as well as apartment houses has been a step-child, so far as heating is concerned.

"All my adult life I've never been able to figure out why a man would invest several thousand dollars in a modern bathroom that has no adequate heating facilities," Mr. Green said. "In the average home, for instance, the bathroom heating system is a part of the general house heating plant, whatever that may be. When a man gets up in the morning, and turns on the house or apartment heat, he usually has finished his shower and shave and is ready to leave before the ordinary heating system has brought the bathroom temperature to a comfortable degree of warmth."

When Mr. Green was called in to assist in planning the Shangri-La apartment hotel he decided the building should have bathrooms that would be warm whenever a tenant decided to enter—day or night. Electric heat, he explained, was ruled out of the question because too large and too expensive a unit would be required in each bathroom.

The bathroom heating system which was eventually chosen is a central plant with a steam boiler in the basement. It consists of a Bryant gas-fired furnace with 148-9/10ths square feet heating surface and an A.G.A. rating of 580,000 B.t.u. per hour. The plant is an automatic low pressure, gas-fired steam boiler, operating with a circulator. It is connected directly to the hot water line, requiring no extra line except an auxiliary return line. It has valve regulation. The bathroom diffuser is in the form of a convector radiator with a 14 square foot E.D.R. rating. The unit is 22½ by 22¼ inches in dimension and is set in a recess 3¾ inches deep. The bathrooms in all 63 apartments of the building are heated by this central system.

Vent Stacks

Design and construction of the building presented a number of problems pertinent to the running of vent stacks. The building has 16 vent stacks which serve the various room heaters, mantel gas-logs, gas radiator installations, gas stoves and blower system. Due to the set-back style of construction above the sixth floor, the Andrews Heater Co., designers of the vent system that serves both the Andrews wall units and the Fraser-Johnson forced air units on the upper floors, were compelled to duck back under the girders at the sixth floor level and install separate short vents for the upper story heater units and for those in the penthouse. To serve six special gas fire places on the sixth floor another system of four inch vents were branched from the master vent to pick up the fire places.

Typical of the vent construction as a whole is the vent stack which serves the series of apartments at the eastern end of the building. The stack is constructed of Transite, an asbestos composition produced by the Johns-Manville Co. It is 70 feet high. Diameter at the first floor is four inches and as each floor is passed increases one inch to culminate in an eight inch vent on the roof of the penthouse. Due to the fact that the pipe lies directly against the concrete, which allows for no natural expansion, Andrews Co. engineers under the direction of Fred J. Andrews, put in expansion joints at every horizontal run, both on those connecting with the heaters on the respective floors and at the cut-back on the sixth floor.

The vent stack is supported on each floor level by a ring of sheet

(Concluded on page 44)

To the left: Typical kitchen in the Shangri-La Apartment Hotel. All kitchens are equipped with latest model gas ranges and gas operated refrigerators. The view through the window extends out over Santa Monica Yacht Harbor to the Pacific Ocean beyond.

Left, below;—One of the gas fire places with which some of the more elaborate apartments on the upper floors are equipped. The main heating sources for the top-floor apartments are forced air gas-fired wall units.

Below, a typical living room in the Shangri-La. These apartments are heated by thermostatically controlled gas wall heaters, as shown, right. The bathrooms of all apartments are independently heated from a gas-fired steam boiler plant in the basement. This dual gas-heating system makes it possible to have bathrooms comfortably warm day and night, irrespective of temperature conditions in other rooms of the apartment.

Condensate Recovery and Recycling Operations

By
Frank H. Dotterweich *

CASINGHEAD GASOLINE or rich wet gas produced by flowing oil wells first was recognized as of commercial importance in 1904. Since that time natural gasoline products have grown in value and today propane, butane, and natural gasoline sales have approached amazing figures. In 1920 the value of natural gasoline products was estimated to be $75,000,000 and in 1932 approximately 7.5% of the gasoline sold was natural gasoline.[1] It is estimated[2] that, today over 87% of the total production of natural gas produced and sold in this country is processed for natural gasoline recovery.

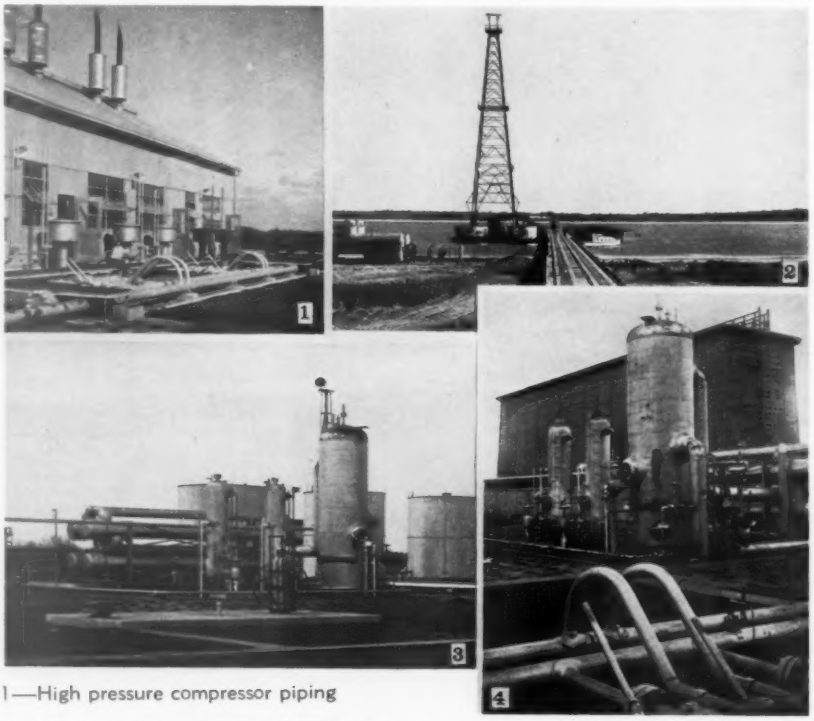
Natural gasoline is not only found in casinghead gasoline, but recently large reserves of high pressure condensate sands have been discovered especially along the South Texas Coast. These sands under high pressure and at high ground temperatures contain these so-called natural gasoline products in the vapor phase and have given rise to the more modern complexing phenomena of "Retrograde Condensation."

Condensate extraction, recycling and repressuring of high pressure gas reserves, embracing a relatively new technology based upon the behavior of hydrocarbon mixtures in the retrograde condensate pressure range has become extremely important during the past two years. This condition has been brought about by increasing discoveries of high pressure gas condensate sands and the classification of these sands as gas sands.

These condensate sands are characterized by high gas-liquid ratios and after a number of hearings in 1938, the Texas Railroad Commission issued an order on January 18, 1939, classifying these condensate wells, in the state of Texas as gas wells. The oil and gas conservation laws of the state of Texas dictate that natural gas produced from gas wells must be utilized for specific purposes and can not be vented to the air or wastefully burned. In the absence of a market, for the large volumes of natural gas produced as a by-product in condensate recovery, it was necessary to develop a method of disposal of this by-product gas. Gas recycling operations have been the answer to this problem in condensate fields. After the extraction of the heavier hydrocarbons, should the gas be returned to the same sand, the term recycling applies; should the stripped gas be injected in another sand this operation is known as repressuring.

Condensate production may result from one of three conditions. First, the condensate and natural gas may compose the entire reserves of the sand to which the name of a pure gas condensate field has been given. Secondly, the mixture of gas and condensate may occur as a gas cap over a large petroleum deposit. Finally, the gas condensate may be the greater percentage of the sand content, but with flanks of the sand surrounded by a narrow oil sand. These so-called condensate sands have pressures ranging from the minimum, for the retrograde range to about an estimated 6,500 lb. per sq. in., formation pressure.

The term retrograde suggests that the phenomena observed are reversed when correlated with those of the accepted custom. Depending upon temperature and composition of the mixture, the behavior of hydrocarbon mixtures do not conform to the simple gas laws predicting vapor pressures and solubility relationships with presures from 700 to 1,200 lb. per sq. in. In the critical region of retrograde condensation the equilibrium of the system may be expressed by a constant which is derived by dividing the percentage of hydrocarbons in the vapor phase by the percentage in the liquid phase and the value of this constant reverses from the usual trend by increasing as the pressure on the system is in-



1—High pressure compressor piping

2—Drilling in Baffin Bay, Kleberg County, Texas

3—Heat interchangers aid in maintaining separator temperature of 20° F.

4—Processing of the gas by dehydration, combined water and adiabatic expansion cooling accompanied by multistage separation of the condensate, insures satisfactory condensate recovery

* *Department of Natural Gas Engineering, Texas College of Arts and Industries, Kingsville, Texas.*

creased, until the entire phase is vapor. Therefore, with hydrocarbon mixtures natural gas and the heavier hydrocarbons, with the prevailing high pressure and temperatures encountered by deeper drilling, this phenomena is found in the so-called condensate sand.

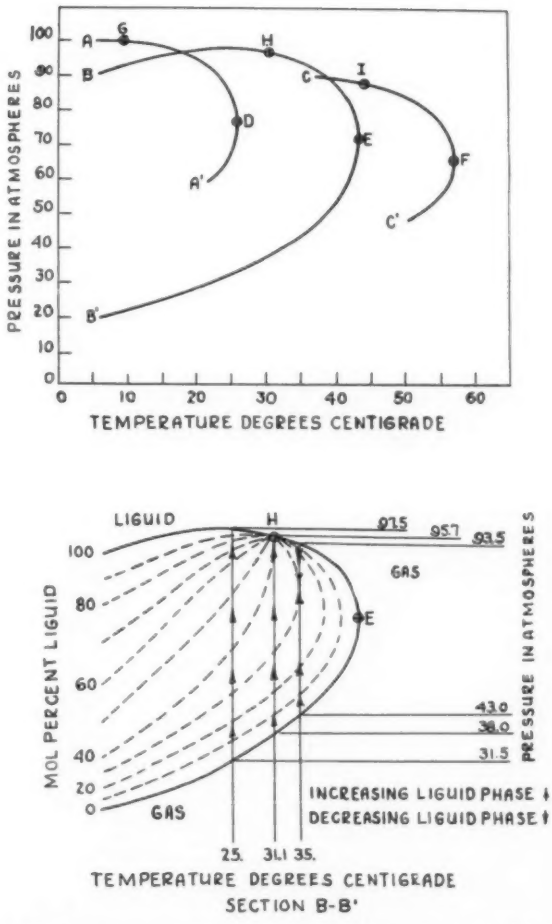
Although the retrograde phenomena was known at the change of the century, all the literature was in the German Language, and research work by B. H. Sage and W. N. Lacey sponsored by the American Petroleum Institute has produced very valuable information relative to this subject. Kay and others[3] have contributed to this subject by their work with mixtures of ethane and heptane. Katz and Hachmuth[4] have worked with mixtures of crude oil and natural gas while Katz and Singleterry[5] have noted the results of natural gas and crude oil containing tar. Other collaborators have conducted related research work and reference to this work is given elsewhere.[6]

A possible explanation of the complex phenomena occurring in the condensate sand may possibly be obtained by studying the work on light petroleum fractions, by Sage, Lacey and Schaafsma.[7]

Patten and Iviey[8] have studied this work of Sage and others[7] and have produced a graph similar to that as shown in Figure 1 to aid in the explanation of the probable behavior of hydrocarbons produced by condensate wells. Figure 1, is of a methane propane system of constant composition as affected by changes in pressure and temperature. The curve, A-A′ is for a 70 mol per cent methane 30 mol per cent propane, B-B′ is for a 60 mol per cent methane, 40 mol per cent propane and C-C′ for a 50 mol per cent methane and 50 mol per cent propane mixture.

A study of the curve B-B′ reveals that the section B′EH is the dew point for the gas phase of this mixture of 60 mol per cent methane and 40 mol per cent propane. That portion of the curve BH is the vapor pressure curve for the liquid phase.

Working with the mixture of 60 mol per cent methane and 40 mol per cent propane, it will be noted that if such a mixture at a constant temperature of 25°C. be compressed, only the gas phase will exist until at a pressure of 31.5 atmospheres a liquid phase will appear. There will be an increase in the liquid phase until the pressure of 97.5 atmospheres is obtained. Above this pressure a uniform liquid phase will be present. If the experiment be repeated at



Methane propane system of constant composition as affected by pressure and temperature changes

31.1°C. a uniform gaseous phase exists until a pressure of 38 atmospheres is reached, then the liquid phase appears and this phase increases until a pressure of 95.7 atmospheres at which pressure the densities of the gas and liquid phase will be similar and the meniscus separating the two phases disappears. This pressure of 95.7 atmospheres and the temperature of 31.1°C. point H is the critical pressure and temperature of the 60 mol per cent methane and 40 mol per cent propane mixture. It should be noted that in a system containing two or more components it is possible to have a liquid phase above the critical temperature, and a gaseous and liquid phase above the critical pressure of the system. It should also be noted that the maximum temperature (the cricondentherm) at which a liquid phase may exist in the various mixtures is determined by the points D, E, and F, respectively and that this temperature increases with increased per cent mol fraction of the heavier hydrocarbon. In addition, the points G, H and I locate the critical pressure and temperature points of their respective mixtures.

When the experiment is repeated with the same mixture at a temperature of 35°C. the liquid phase appears at a pressure of 43 atmospheres and with increased pressure the liquid will increase up to a certain point after which this procedure is reversed and the liquid phase decreases until at a pressure of 93.5 atmospheres it completely disappears and only the gaseous phase appears. This experiment at 35°C. with the varying pressures on such a hydrocarbon mixture illustrates the phenomena of retrograde vaporization of the first type. Should the experiment be repeated at 35°C., but starting with a pressure in excess of 93.5 atmospheres only the vapor phase would have been apparent, however, when the pressure was dropped to 93.5 atmospheres the liquid phase would appear and increase with lower pressure in the retrograde range, and this procedure would be referred to as retrograde condensation.

In general, the recycling operations in Texas today consist, of producing

the wet gas from output wells, processing by one of three general methods, and the compression of the gas to permit its injection through input wells back into the sand. The three processing general methods being used by recycling plants are moderate cooling and separation; dehydration, extreme cooling and separation; and high presure oil absorption.

Condensate recovery by moderate cooling and separation is the simplest method of extraction. In this operation the gas is cooled and the pressure reduced to a point within the retrograde range, the condensate extracted and the gas compressed and injected into the sand. The cooling effect may be obtained by adiabatic expansion or a combination of this process with various additional methods of cooling. However, in this method the cooling of the gas is limited to about 65°F. because at this temperature and a pressure of 1,200 pounds per square inch trouble from hydrate formation is experienced. This method of extraction is popular in fields where a heavy condensate is produced and a satisfactory separation may be attained with temperatures above 65°F.

In fields where the condensate is composed of a high percentage of the intermediate hydrocarbons extreme cooling is required for satisfactory yields. A plant of this type has been described.[9] In order that fluids may be cooled below the temperature at which hydrates form, it is necessary to inject brine into the flow stream. In one type of plant using extreme cooling the gas enters from the field and is first cooled and the water separated that has condensed at this point. The removal of this water will eliminate to some extent the dilution of the brine to be injected. After the water separation the brine is injected, then the gas enters an interchanger where it is cooled by the cool dry gas coming from the condensate separator. The cooled gas to be processed is then further cooled by adiabatic expansion and the condensate extracted. The condensate and brine are separated, the brine reconditioned and recirculated and the condensate processed or marketed as raw condensate.

The high pressure oil absorption method is reported[10] to give almost complete recovery of the condensate. The gas to be processed is scrubbed by mineral oil in absorbers operating at pressures between 1,100 pounds and 1,200 pounds per square inch. It has been reported that absorption may be practicable at pressures up to 1,500 pounds per square inch if suitable absorption oil can be obtained. Apparently the satisfactory operation of such plants is dependent upon a satisfactory type of absorption oil and the proper conditioning of this oil combined with efficient steam utilization.

The ideal recycling operation may employ one of the preceding methods of condensate extraction and with proper pressure maintenance the maximum yield of condensate be realized, in addition the dry gas is conserved and stored for future gas consumption. To obtain maximum condensate recovery it is necessary to plan the field system so that the location of the output and injection wells may dictate the efficient displacement of the condensate from its natural reservoir.

Recycling operations of today in general are restricted to large acreage fields. Recycling in many other fields is possible but subdivided interests have restrained this new operation to a minimum. With subdivided interests the only successful recycling program is that of unitization. The principals of unitization and pooling in the oil industry of today are only now being accepted in some cases. To hope for the adoption of unitization on a large scale in the relatively new industry of recycling would be highly optimistic. The case of unitization in recycling is of extreme importance not only because of the advantages it affords the operators but also the successful development of the recycling program is dependent upon it. This question of unitization has been completely discussed elsewhere.[11]

As in the case of all new industries there are many economic facts for and against the construction and operation of recycling plants. In addition, the question of legislative control of recycling operations cannot be overlooked. In the state of Texas the only proration of recycling plants is that applied to the allowable percentage of a gas well's potential flow. During the last session of the Texas legislature the proration of recycling projects was proposed. The recycling operation is an example of conservation, therefore the reduction of the allowable of gas wells from the present figures cannot be attributed to wasteful operations. With increased recycling operations accompanied by increased condensate output the gasoline market should not be affected for some time to come in that stabilization and distillation equipment in recycling projects permit processing of the raw condensate. The condensate when properly processed may be marketed as naphthas, motor fuel and kerosene.

Surveying recycling operations it will be noted that there is much to be accomplished by research work on production problems, unitization and other related problems but the growth of this industry continues at a rapid pace. The petroleum industry of the future will experience drilling to greater depths and gas recycling will become more important, in that, drilling to greater depths will introduce more condensate wells and as higher pressures are encountered greater waste will result unless pressure maintenance is achieved by means of recycling operations.

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Panhandle Eastern Will Build 105 Miles of New Pipe Line

Following a meeting of the Panhandle Eastern Pipe Line Company directors, held in New York on June 21, J. D. Creveling, President, announced that, because of the increase in the demand for gas throughout the company's system, the board had authorized a new construction program involving the expenditure of $2,800,000. The program calls for the construction of 105 miles of 24-inch, 22-inch, and 20-inch pipe line "looping" to provide additional facilities for the company's growing market requirements. The work will be financed out of the company's present working capital, Mr. Creveling stated. This program is in addition to the $3,500,000 expansion project now nearing completion.

All officers of the company were reelected.

Avoid Legal Losses, and Points to Observe

By

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VERY FREQUENTLY gas corporation executives, officials and employes are surprised to learn of adverse decisions in suits which were filed under circumstances which, at first hand, appeared to lend little or no chances for company liability. In many of these cases the real and important reason the company lost the suit is because executives and officials were not aware of likelihood of legal controversy, and subsequent liability.

Therefore, the purpose of this article is to impart information on subjects of law especially interesting and informative to gas corporation executives and officials, and intended to forestall legal controversies of unusual kinds.

One important subject relates to contracts. Of course, contract law is complicated, and requires a great deal of study to master. However, we shall deal only with subjects of special interest, and of which the average layman has little or no knowledge.

Few readers are aware that "consideration" in contract law results in many surprising adverse verdicts. Take for example, a late case in which the court held a gas company liable in damages because an official failed to realize that a mere promise on the part of one contracting party and without a promise on the part of the other party to "do something" does not result in a valid contract. The legal effect of this case proves that both contracting parties must agree to perform some kind of service, work, or benefit, otherwise that contract is void and ineffective.

In another case, a person named Brown owed $3000 to a former employer named Wilson. The owner of a small gas plant desired the services of Brown who refused to take the employment because he owed this money and believed that Wilson intended to attach his wages. Therefore, the owner of the gas plant entered into a contract with Wilson by the terms of which he agreed to pay to Wilson the sum of $3000 owed by Brown. Later litigation resulted and Wilson sued the

owner of the gas plant to recover the $3000. However, the higher court held that Wilson was not entitled to a recovery and explained that the contract was not valid because Wilson had not given any consideration. In other words, the owner of the gas plant had agreed to pay Wilson $3000, but the latter had not agreed to perform any service, work or benefit for the owner of the gas plant.

Also, take for example another leading case in which a gas company agreed to pay compensation to a gas company employe who was injured while he was doing work for his own benefit. In this case also the higher court held the gas company not liable because there was no valid consideration.

On the other hand, let us review another late case in which a gas company official agreed to pay an employe a bonus of $1000 each year if this employe would leave his present employment and take employment with the gas company. In this case the court held the official liable on the contract because he was benefitted as a result of the employe taking employment and rendering valuable services for the company.

In other litigations, involving contracts, the courts have held that consideration of a contract need not be any special service or benefit, and a mere promise on the part of one party to do something is valid consideration, if the other party also promises or agrees to do something for the benefit, or with respect, to the other contracting party.

Authority to Make Valid Contract

Obviously, the law books are full of cases involving the validity of contracts made by gas company officials and executives. Generally speaking, contracts of this nature are valid and effective if such official or executive had proper authority, either through the directors of the corporation, the by-laws or broadly through other legal channels, to make the contract under litigation.

However, the majority of unusual contract litigations in this classification arises where a common employe makes a contract or agreement. Therefore, we shall review the law on this subject.

The law is well established that there are two distinct kinds of gas company employes. One class is, from a legal standpoint, known as general agents. The other is special agents. Now, a general agent is one who has special authority to perform work and duties in a particular department. A special agent is an employe who is authorized to do only special acts. Naturally, a company is not liable for acts performed by a special agent outside the scope of the employment, and neither is the company liable for acts or contracts performed by the general agents outside the scope of employment. However, the important point is that a general agent has broad powers, whereas a special agent has only limited powers.

For example, in one case the court held a gas company liable in damages for an injury done to a consumer by a meter reader where the testimony showed that a fight had occurred between the consumer and the meter reader as a result of a disagreement over the latter entering the house. On the other hand, in another case the court held the gas company not liable for an injury caused by a janitor who became angry at a person who had entered the building. In this case

the court explained that the janitor was employed only to clean the premises and that he had acted outside the scope of the employment when he became engaged in an argument with a person on the premises; whereas in the other case the court held that a meter reader was acting within the scope of the employment when performing any act having a direct relation to his authorized act of entering the building to read the meter. In order that readers may appreciate the distinction made by the courts with respect to the authority of the janitor and the meter reader, it is important to realize that the janitor had no authority to do any thing but clean the building; but the meter reader had authority to enter the house, and therefore the latter had implied authority to perform all other acts connected with entering the building, which resulted in the gas company being liable.

On the other hand, let us review another case in which a gas company was sued for damages by a person who was injured by a janitor who used undue and injurious force in ejecting a patron from the premises. In this case the janitor had authority to maintain good order on the premises, as well as keep the premises clean. The testimony showed that a patron, who was disorderly and drunk, came on the premises and the janitor ordered him to leave immediately. The patron refused to leave and the janitor struck him causing a severe injury. This court explained that when a person has authority to maintain order on gas company premises, such person cannot use undue force to eject the patron, and if he does so the company is liable for resultant damages. This court, also, explained that in order to relieve the company from damages the person authorized to maintain good order must, first, approach the disorderly person and in an ordinary tone of voice request him to leave; second, if the patron leaves or offers to leave no hand may be placed upon him, but if he refuses to leave then, under these circumstances, the person employed to maintain good order may use the necessary degree of force to eject him without any liability on the part of the gas company. However, care must be used to not first request the disorderly or undesirable person to leave in a loud or insulting tone of voice, as there are higher court cases on record which hold that humiliation is ground for liability.

Authority of General Agent

Of course, the liability and authority of a general agent differs from that of a special agent. A general agent may be any person who is employed and authorized to perform all ordinary and general acts necessary to conduct a particular department or departments of a gas corporation. For example, in the case of a purchasing agent, the company is liable for all contracts made which relate to the purchase of materials and supplies intended for company use, provided the directors or by-laws authorize the purchasing agent to make valid contracts. On the other hand, let us assume that the purchasing agent has limited authority to submit contracts to company officials for approval, and the purchasing agent attempts to exceed his authority and makes a binding contract. Under these circumstances, the contract is void, unless the seller can introduce testimony that in the past contracts made by the purchasing agent were accepted by the company officials. In other words, this law clearly indicates that although a general agent has only limited authority, yet his authority may automatically be enlarged by any acts of officials which indicate that the general agent's authority is unusual or otherwise extended.

For illustration, in one case the evidence showed that a purchasing agent made two contracts with a company and the gas company accepted and paid for the materials without sending the seller approval of the contracts. Later, this purchasing agent entered into a contract with the same seller by the terms of which the gas company was obligated to accept and pay for an unusually large quantity of material. The court held the gas company bound to accept and pay for the material, because in the past the action of its officials in accepting and paying for merchandise, without sending approvals to the seller, implied that all contracts made by the purchasing agent would be accepted by the company as valid and enforceable.

However, in another case it was disclosed that a purchasing agent was authorized to make valid contracts for purchase of materials and merchandise for a gas company. Moreover, the company had never failed to honor purchase contracts made by the purchasing agent. A seller which had in the past sold much merchandise to the company took a contract from the purchasing agent for a large quantity of material which was not to be used in the company's business but which was intended for the personal use of the purchasing agent. In this case the higher court held the gas company not liable on the contract. Therefore, the legal effect of this decision is that all sellers are bound to know that acts performed by, and contracts made by, general agents actually relate to the employer's business, and if the seller fails to verify such contracts the purchasing company is not obligated to pay for the purchased materials.

Still another important point of the law relates to contracts made for gas companies which are outside the scope of the authority of the person who makes the contracts, although such person is authorized to perform services for the company in the general line of work. For example, in a late higher court case the court held a gas company not liable on a contract made by high company officials and explained that all who transact business with a corporation are bound to know that the representative, who represents the corporation, has proper authority to make the contract and obligate the corporation. In this case the testimony showed that the officials had broad authority to obligate the gas company, but that in this instance they had made a contract not broadly authorized by the corporation's charter. Of course, the law is well settled that the highest authority, as directors, of a gas corporation cannot bind the corporation on obligations not clearly within the scope of the corporation's charter.

Personal Liability of Officials

Various higher courts have held that all gas company officials and executives must use great care to not enter into contracts written in such a manner that either or both the company and the officials are personally liable. For example, in one case the court held an official personally liable on a note signed and intended to bind the corporation, where it was shown that the note was signed by the official indicating that he assumed the obligation. Of course, this liability may be avoided if officials sign contracts in this form: "The Great Gas Company, Per G. D. White, General Agent," or "The Great Gas Company, by G. D. White, Purchasing Agent." However, the official is personally liable if he signs, as follows: "G. D. White, General Agent," or "The Great Gas Company, G. D. White," or if the company name is in the body of the contract and the signer affixes his signature without

making it clear that he is signing for the company and as its agent or representative.

Many cases are on record where officials have been held personally liable on improperly signed contracts although, of course, it may have been assumed that the official had no intentions of binding himself on the contract, note, or other obligation.

Moreover, an official who performs, acts or makes contracts outside his scope of employment is personally liable. This law also is applicable to all employes. For example, in one case it was shown that a general manager of a gas company assumed authority to contract to have a new heating system installed. Although he made the contract intending to bind the corporation, yet the court held that he was personally obligated to pay the full contract price where the evidence proved that he had no authority to bind the corporation; the contractor made the installation believing that the official had authority to bind the corporation, and the official believed that he was acting within his authority, but in fact was not properly authorized. Therefore, it is quite apparent that all gas company officials should use care when attempting to bind the corporation. Because, there are many circumstances under which the other contracting party may be compelled to seek payment from another other than the corporation, and the official who exceeded his authority is personally liable. Of course, the fact that the official, or other employe, was authorized by his employer to make a certain contract does not reduce the liability of the employe if the employer contends that the employe exceeded his authority. The important consideration is: Did the other contracting party know that the employe did not have the proper and legal authority to bind his employer? If the other contracting party can prove that he believed that the official or employe had the proper authority, then such official or employe may be held personally liable on the contract intended to bind the employer. The legal effect of these cases is that all officials and employes are bound to know their legal rights and authority to bind the gas corporation. Failure to act within the scope of the employment naturally results in the other contracting party not being able to collect from the gas company and, therefore, he may sue and recover from the official or employe who exceeded his authority.

Still another interesting and well settled point of law is that where two parties perform an act injurious, either financially or physically, to another the one whose greater degree of negligence resulted in the injury usually may be held personally liable. In other instances, where two parties cause an injury both may be held jointly liable. And, in other instances, the one who had the last clear chance to prevent occurrence of the injury is solely liable. Now, this law is applicable in all cases where two parties cause an injury, whether the injury is financial, physical, or otherwise.

For example, assume that an official contracted for a gas company; and before the opportunity had passed to correct a defect, negligence, or fault, which would have resulted in an injury, the official performed an act which avoided the injury. Obviously, since no injury was effected, no one is liable. However, if such official failed to perform an act which would have avoided the loss or injury, he may be held either solely or jointly liable with the other party who, also, is at fault providing, of course, that negligence or exceeding authority on the part of the official was a direct cause of the loss or injury.

On the other hand, let us assume that a gas company official and another party jointly perform an act injurious to the company. Under these circumstances, both the official and the other party are jointly liable. But if the official exercised a greater degree of negligence, and the other party is not financially responsible, then the company may hold the official solely liable.

Of course, if a gas company official and a seller of material, for example, perform an act or enter into a contract by which the gas company suffers loss and, also, the seller sustains a loss, this is an entirely different situation. Under these conditions the seller must bear the loss if his negligence was greater in degree than that of the gas company official, because the law provides that where two parties are negligent, the one whose greater negligence is proven is the one to bear the loss. Of course, even under this statement of facts the official still may be held responsible to the company if the official had opportunity to prevent the loss or injury and failed to exercise this chance. With respect to negligence, the courts hold that a person never is negligent unless the testimony proves that other prudent and reasonably careful persons experienced in the same business would have prevented the injury and under the identical circumstances. Naturally considerable testimony sometimes is required before a court may come to a positive decision, particularly when this point of law is presented.

For example, in a late case, the court refused to hold a gas company official liable for cashing a forged check, where the testimony proved that the person who prepared the forgery had in many instances in the past presented forged checks to bank tellers who were unable to detect the forgery.

Court Ruling on Recovery of Equipment Sold on Time Payments

The Georgia State Supreme Court has ruled that a gas appliance sold on time payments cannot be recovered by the seller if it has been installed as a unit of existing property.

The Atlanta Gas Light Company had sued Mr. and Mrs. William Farrell, of Atlanta for a $150 gas appliance after the Farrells had sold to a tenant the property in which the appliance had been installed.

The Georgia State Court of Appeals had ruled that the company had no recovery against the buyer of the appliance because it "became a part of the realty upon its installation," and the Supreme Court sustained the Court of Appeals in its ruling.

The appliance in question was a gas conversion burner which had been installed in the furnace of the house.

Smokeless Gas Heat

The St. Louis Clean Air Exposition opened in the Kennard Building, on May 18 and ran through June 29 every day except Sundays. It was sponsored by the Division of Smoke Regulation of the city, The Committee for Smoke Elimination, the Chamber of Commerce, the automatic firing industries and smokeless fuel industries of St. Louis.

Laclede Gas Light Co. had a large, attractive display at the show.

USE SMOKELESS GAS HEAT NOW . . . 20% CHEAPER was the bannerline which headed their exhibit, done in attractive blues, orange and white. The exhibit featured all types of gas heating equipment . . . gas-fired boilers, circulators for homes without central heating plants, cutout of furnace showing conversion burner installation, winter air-conditioning unit, water heaters, unit heaters for commercial jobs, etc.

A Correction

In an article, "Progress on Heating Appliance Code in California," June issue, by Fred A. Herr the formula on page 26 should read $B = 350\ G[1 + 0.02\ (R - 20)]$.

The Selling Parade

A Digest of Successful Selling Ideas

By
Charles B. Roth

BOB WATKINS IS A SUCCESSFUL salesman now, but I remember well when he was teetering on the ragged edge. He laughs about those dark, discouraging days — but he didn't laugh when he was living through them.

Often as he's told me the story of his regeneration as a salesman, I never tire of hearing him tell it, because each time I see a new application to my own selling, to that of every other man who sells. I think you will see how it also applies to yours.

Watkins started out carrying a wholesale catalog through the Ozarks; a young city kid full of zip and vinegar, a go-getter if one ever stepped out of a day coach. But it didn't work.

He made twenty-three calls his first day, and no sales. That night, low in spirits, he slumped into the cracked leather hotel lobby chair and poured out his heart to the clerk, who was a gentle elderly man, a native of the Ozarks.

"The only trouble with you, son," said the clerk, "is that you're not selling their way. You're trying to make them buy your way. It don't work, that kind of business."

Watkins asked what he meant.

"Well," the clerk replied, "what do you do when you go in to see your prospect?"

"Introduce myself, try to get some business. What has that to do with it?"

"A great deal. That's not the way to sell down here in the Ozarks."

"What is the way?"

"I'll tell you. When you go into a store and see a fellow sitting down on the counter, you sit down there, too. If he wants to sit without saying anything, keep your mouth shut. If he wants to talk about something a million miles away from business, don't try to change the subject. Talk about what he wants to talk about," said the kindly advisor.

"But I'll never get anywhere that way," Watkins remonstrated.

"Did you get anywhere today?"

"No."

"Why not try my way tomorrow then? Don't talk business until your man wants to talk business—remember."

"All right. I'll try."

Watkins called back on his twenty-three prospects of the day before—and sold twenty-one of them.

He learned then one of the most important selling lessons of all; namely, that the salesman must take his tempo from the buyer. In other words, you have to sell 'em the way they want to be sold or you don't sell 'em.

* * * * *

I ACCUSED ONE OF MY boys of having *katabolism*," chuckled the man who is responsible for sales for a good-sized organization, "and it made him so mad he wanted to fight. He thought I was insulting him."

"You were," I put in, "because to tell a man he has that affliction is the same as saying he'll never in this green world be a salesman. *Katabolism* and salesmanship don't jibe."

"But salesmanship and *anabolism do*," said my friend.

And thus did my friend and I, who love to chaff each other, talk in terms that I often think even we don't understand. But I know what these two words mean, know that they help or deter salesmen.

Anabolism is the quality in the blood secreted by happy emotions—goodwill, kindness, friendship, good humor.

Katabolism is the toxin evolved by fear, hatred and all forms of unkindness. It clogs the digestion, upsets the circulation, embitters.

The discovery that emotions control the secretions was made long ago by Herbert Spencer, greatest thinker to express himself in the English language.

Said he: "A poison is only a concentrated form of hate."

I tell that to salesmen when they get to hating this or that. Hatred spoils sales. Kindness makes them.

* * * * *

WHEN MEN TALK ABOUT economic waste they seldom get around to the one big waste of selling energy. It is the waste which comes from talking to the wrong person. You may make your contact ever so diligently, present your proposition ever so effectively, but—unless you reach the right man you waste your time, your words, your energy.

What to do?

The answer has two parts.

First, prospect ahead so that you know who the right man is.

Second, don't be put off by office boys or anyone else. Don't talk to "assistants," "secretaries," and such supernumeraries. Stick to your guns, and see the right man, or go somewhere else where you can spend your selling time with a possibility of getting results.

* * * * *

THERE'S A MAN IN New York City, Charles Addison Parker, who believes that salesmen could sell more if they would learn how to interest their prospects more. He has been eminently successful himself. He says that's because he tries to make everything he sells so interesting that people listen to him eagerly.

"Don't the things of life deserve as fine and as vivid and as effective telling about as will stir folks deeply?" asks Mr. Parker.

"For example, let's be a little housewife in a cheap apartment.

Today's a big day. Six chairs in a very ugly color of golden oak, a table and a hallrack to match have just been unloaded from an installment house.

"Pretty prosaic picture! That's only because we are blind. Why, that cheap furniture is ennobled for her, because her Jim took a job as night porter, rather than lie idle. And it's *his* boundless affection that is coming up those stairs as golden oak furniture. "Make Mary a lady!" has sold lots of pianos.

"This package of rolled oats? This is not merchandise. This is food for six hungry children. This player-piano? This is something for a lonely man to lean his soul against and listen to the melodies *she* used to play.

"Feeling—aye, there's the universal key that fits all hearts and pocketbooks. Please, Mr. Salesman, be my friend. Then you can sell me in a way that will do something wonderful to me. Tell me stories. Give me a lump in my throat once in a while. Be human with me."

* * * * *

OLEY JACOBSON TOPS his sales force in the West. No one ever saw a salesman who was more skilled at getting attention. He can go in on a man cold and inside of a few seconds have his attention firmly riveted.

In short, Oley Jacobson has mastered one of the most important and profitable arts of salesmanship—the art of the approach.

His approach is built around a dollar bill. Just an ordinary dollar bill, the kind you carry around with you every day. The way Jacobson uses it is masterful. He approaches his man, pulls the dollar bill from his pocket, exhibits it before the prospect's eyes.

"Do you have all of these you want?" he asks, putting on his most engaging smile.

"No," replies the prospect. "Do you?"

"I should say not," is the honest reply. "Let's talk about how both of us can get more."

"That sounds interesting. Shoot."

And Jacobson has what he wants —ATTENTION.

Jacobson uses what we call the direct-sense route to attention. He puts something in front of his prospect's eyes, and the prospects can't help being interested.

* * * * *

IF I TELL YOU THE story of a plain clothes detective, don't think I have failed to keep my eye on the ball. But I learned about selling from working with this efficient officer.

Tommy Box is a member of the Immigration Service Border Patrol, doing plain clothes work in El Paso. He asked me if I'd like to go the rounds with him.

"I'd like nothing better," said I.

"I've got a handful of leads," he told me. And such leads! They took us into dumps and dives, into noisome Mexican apartments in the lower part of town. We interviewed marihuana addicts, hop heads, adulterers —all sorts of criminals.

As persistent as a bulldog, Tommy followed one lead after another—and they all petered out. At the end of the day we hadn't made a single catch.

"Doesn't it get you down to work so hard and accomplish nothing? I asked.

"Not for a minute," he told me, "Want to know why? Because I know that every time I follow a bum lead, I'm just that much nearer to making an important apprehension. So I say, 'Well, that's one more step toward something really good,' and then I go on. It never fails. We have a certain average in this business."

I told you that it was a side road I was taking you on, but by now you have caught the point. Which is this: That what Tommy Box told me about his work also applies to yours. You have a certain number of fruitless contacts to make—you must have a certain number of prospects who will kick out on you. But each wasted call you make takes you nearer the time when you land a big order.

So keep on.

That is what Tommy Box does—and no one in his service has a better record for getting the job done right.

Modern Apartment House Has CP Range in Every Kitchen

Definitely designed for better living are the apartments in the 125 Ocean Parkway Building, Brooklyn, N. Y., which is the first apartment house in the country to install CP gas ranges in every kitchen, according to Leonard F. Genz, Apartment House Sales Supervisor of The Brooklyn Union Gas Company.

Jerome Tunney, a Brooklyn Union salesman, sold 84 CP ranges and 84 Servel gas refrigerators to the builders, the Caton Park Estates. These builders have firm faith in the superiority of gas. This has been shown by their decisions for the eight apartment buildings they have constructed since 1927. In each case gas has been selected for cooking and refrigeration.

These builders were pioneers in the apartment house field in using heat control ranges. Since their first satisfactory experience with this type of range, they made it a policy to install heat control ranges in every apartment building they erected. Now they are the leaders in the apartment house field in selecting CP ranges, the most up-to-date cooking appliance.

This apartment house represents a departure from the conventional apartment dwelling. Combined in one are the best features of the apartment house and private dwelling. Facing the century-old trees on Ocean Parkway and unobstructed views to the east and south, the terrace apartments offer "a place in the sun" to those who have always associated terraces with the high rentals of exclusive Manhattan apartments.

Eighty-four CP Gas Ranges and 84 gas refrigerators go into this up-to-the-minute apartment building in Brooklyn,—the first in the entire U. S. to install CP ranges in every kitchen.

Cooperative Campaign Sells 3000 Non-Ferrous Gas Water Heaters in Southern California

1200 Merchant Plumbers Join in Sales Campaign

By

Robert A. Latimer

BELIEVED already to have the highest saturation of automatic gas water heaters of any comparable area in the world, 1200 merchant plumbers, cooperating with the Southern California Gas Company and the Southern Counties Gas Company, recently set out to sell *more* automatic gas water heaters to metropolitan Los Angeles and the towns and cities in ten nearby counties. The campaign was highly successful in resulting unit sales: moving of 2000 units was anticipated; actual result was an estimated sale of 3000 units during the 60-day merchandising period to produce what, all told, was probably the most gratifying water heater campaign ever staged in this area.

A special retail price reduction, trade in allowances and terms all encouraged buying. Newspaper advertisements, outdoor posters, bill stuffers, truck cards, display material in gas company offices were used and appropriate store and window banners and other point-of-sale matter were distributed free of charge to merchant plumbers.

Better-Type Heaters

Specifically, the campaign, which opened February 26 and concluded April 30, was a promotion of non-ferrous heaters. For easier understanding this was announced to the public as a sale of "Rust Proof Gas Water Heaters—Save $15-$30." The term rust proof, featured on the seal fastened to eligible heaters and appearing in the advertising copy, had the qualifying phrase "Longer Lasting." Gas company officials and merchant plumbers explained that this meant customer satisfaction, better service, long run economy. It was pointed out that the promotion was not intended simply to merchandise specials but had the long-range object of building public preference for gas water heaters of the better type.

Unlike ranges—unlike automobiles or dresses or any of a number of other items of merchandise—style and beauty play little part in the sale of gas water heaters. A heater is purely a utility item; it is rarely if ever replaced because "the Joneses —next door—have a nicer looking one." All too often replacements are deferred until the old heater is in a dangerous condition, and sometimes even beyond that point. Thus, in a saturated area, price competition becomes a major factor and as heaters of lower cost are sold there results a lowered quality, a reduced gross, even a sharply reduced margin which is likely to be deadly for the plumbing dealer. All this the campaign was intended to offset.

Many Replacements

Although Los Angeles and the region surrounding it is definitely in the replacement phase with more than 90 per cent of the heaters sold supplanting old automatic gas tanks—largely, it appears, because this is a natural gas region—it is said to be still the best single geographic water heater market in the country in point of sales. Undoubtedly it is present and past cooperative action of merchant plumbers and the gas companies which has accomplished this: the one organization providing an intensive advertising campaign which individuals could not afford, the group of plumbers making it an effective means of building sales.

Seal Used on Rust-proof Heaters

"The campaign is an opportunity," explained the manual addressed to the participating merchant plumbers, "to sell more and better water heaters, and also an opportunity for us to make a permanent, lasting improvement in our water heater business. Of course we want to make sales during the campaign, and to do so we must present it as a buying opportunity—a bargain! But we must not overlook the excellent occasion it provides for public education, for telling those who may not buy in the campaign all the reasons why they should buy, when they do buy, a really better water heater. No industry has ever hurt itself by putting its best foot forward! A forceful, logical, and convincing story as to why water heaters fail and what should be done about it, will permanently influence public preferences to our benefit. Let's sell the campaign, and sell it hard, but let us not fail, at the same time, to tell all our customers about the longer life, greater satisfaction, and true economy of better-grade automatic gas water heaters."

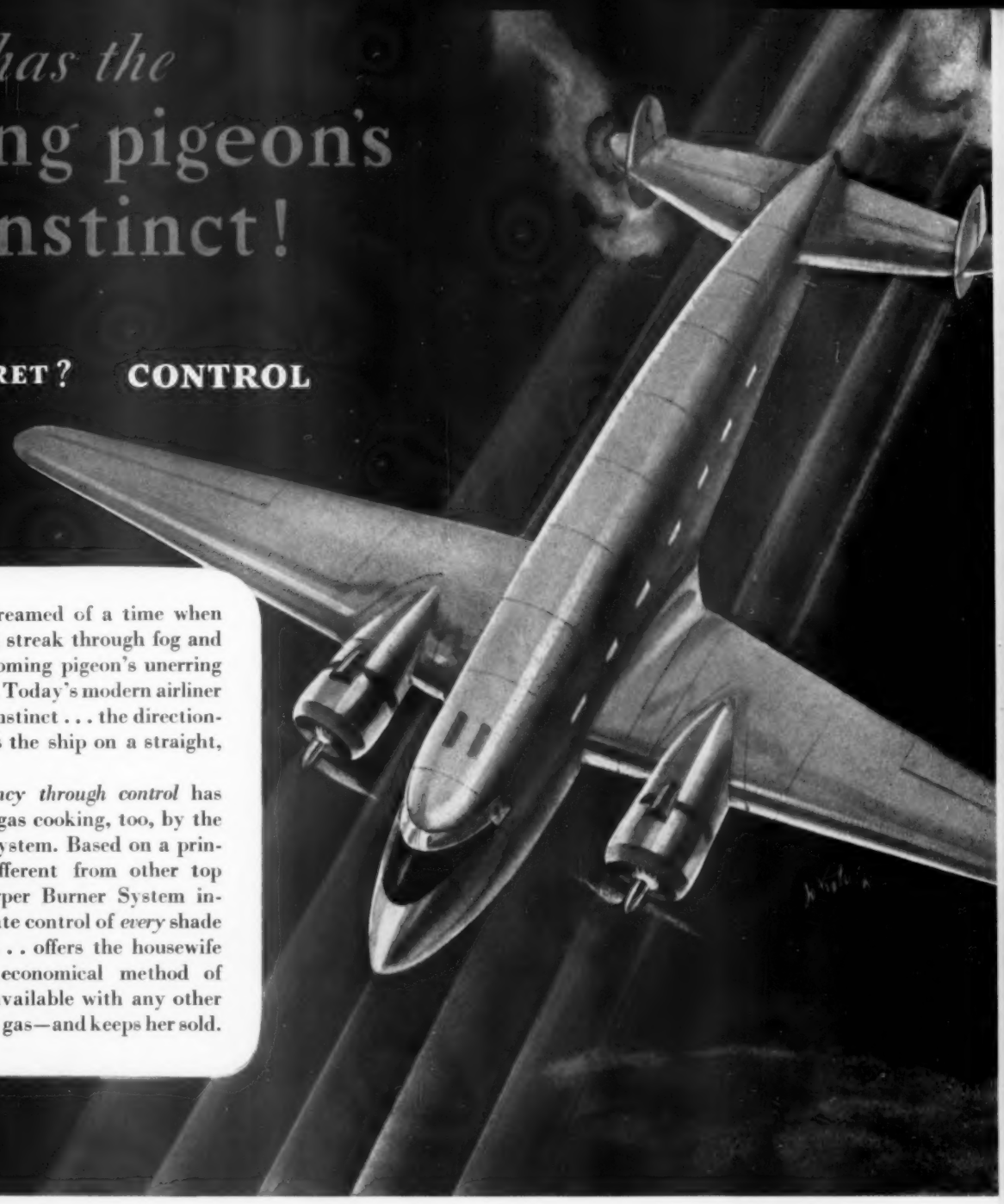
The Sales Plan

General operation of the plan was this: During the campaign, provided the installation met certain qualifications, the purchaser received a special price reduction. Through the manufacturer the gas company paid the dealer a subsidy which so lowered his cost that the normal percentage of mark-up was not impaired. To be eligible for the campaign water heaters had to have non-ferrous tanks and must have been entered by the manufacturer and accepted by the gas companies for participation. A dozen or so manufacturers had units included in the special drive.

A retail price reduction computed at the rate of 75-cents per gallon of rated tank capacity was offered during the campaign—$15 for a 20-gallon size, $22.50 for a 30-gallon size, and so on--in addition to the regular trade-in allowance. As a special inducement for the replacement of non-automatic gas water heaters during the campaign period the gas com-

It has the homing pigeon's instinct!

THE SECRET? CONTROL



Early aviators dreamed of a time when their ships would streak through fog and night with the homing pigeon's unerring instinct for home. Today's modern airliner *has* the pigeon's instinct . . . the direction-finder that keeps the ship on a straight, true course.

Greater *efficiency through control* has been brought to gas cooking, too, by the Harper Burner System. Based on a principle entirely different from other top burners, the Harper Burner System insures easy, accurate control of *every* shade of cooking heat . . . offers the housewife a better, more economical method of cooking than is available with any other fuel . . . sells her on gas—and keeps her sold.

Copr. 1940, Harper-Wyman Co.

CONTROL *is the secret here, too*

● The Harper Burner System is a patented invention whereby each of the burners on the range is actually 2 burners in 1 . . . a burner within a burner . . . both operated and controlled by a single handle.

This arrangement affords a high-speed STARTING BURNER to *start* foods boiling and for fast frying . . . plus a small, central, economical COOKING BURNER for *maintaining* the cooking. The COOKING BURNER can be used entirely independently of the STARTING BURNER. No other top burner possesses this vital advantage — which insures easy, accurate control: just the right heat for every type of top burner cooking . . . every time.

HARPER-WYMAN COMPANY
8562 Vincennes Avenue, Chicago, Ill.

HARPER BURNER SYSTEM

HARPER BURNER SYSTEM

Demonstrates GAS at its best

SEE OTHER SIDE OF THIS PAGE

The Harper Burner System eliminates

Guesswork in Cooking

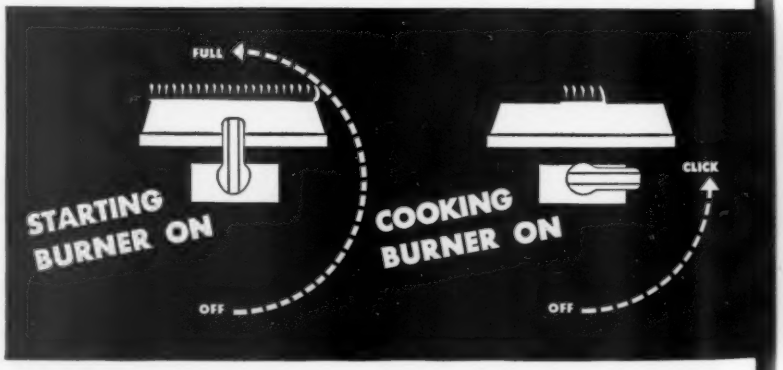
HARPER BURNER SYSTEM

FACT: The Harper Burner System permits more flexible and accurate heat *control* than any other top burner . . . eliminates guesswork in cooking.

REASON: Regulating the ordinary burner is like trying to drive a car always in high gear . . . very low speeds are impossible. Harper construction is based on a STARTING BURNER and a COOKING BURNER that function as *distinctly separate* units, just as do the high and low gears of the automobile transmission. This of course increases the range of heat temperatures and control many fold. When lower heats are desired, the STARTING BURNER ceases to operate, and the COOKING BURNER (with its fewer flame ports) takes charge.

BENEFITS: The guesswork is taken out of cooking because the Harper Burner System makes it easier to gauge the exact amount of heat desired for every type of cooking. This *exact control* doesn't vary . . . with the Harper COOKING BURNER it always takes more than one hour to boil away one cupful of water in a covered vessel.

Substantial gas savings are possible, because this *exact control* has made practical new methods of cooking . . . less water is required. These new methods not only save cooking time and banish pot watching, but also help to retain more of the important vitamins and minerals in foods.



The Harper Burner System provides a burner within a burner. The diagram above shows how the COOKING BURNER operates entirely independently of the STARTING BURNER. Yet both are controlled by the same handle.

We shall be glad to send you, without cost, two booklets that tell the complete Harper Burner System story . . . "Modern Methods of Top Burner Cooking" and "The Greatest Cooking Discovery in 40 Years". They should be valuable to anyone interested in the promotion of gas cooking and gas appliances. *Harper-Wyman Company, 8562 Vincennes Avenue, Chicago.*

SEE OTHER SIDE OF THIS PAGE

HARPER BURNER SYSTEM

panies accepted for financing sales contracts with no down payment, except for state sales tax, in those cases where an eligible heater, or any other qualified for gas company financing, was sold to replace one manually operated.

The gas companies' subsidy payment to the manufacturer for credit to the dealer was based not on the sale of an eligible water heater, but rather on its installation on their lines for domestic use, according to standard requirements for financing and in conformity to applicable ordinances. Further, except for new construction, installation had to be completed between February 26 and May 4, 1940. With approval of the serving gas company, installation could be delayed "for a reasonable time" on new building actually under construction on May 4.

Due to longer life expectancy, the gas companies emphasized proper sizing, indicating that this is of even greater importance with non-ferrous heaters than with ordinary types. Including a tolerance of 2 gallons in sizes specified, so that a 30-gallon size means, for example, from 28 to 32 gallons, they thus charted minimum recommended storage tank sizes for ordinary domestic use:

Total Number of Rooms excluding Bathrooms	*Number of Bathrooms* 1	2	3
2	20	—	—
3	20	—	—
4	20	—	—
5	20	30	—
6	20	30	—
7	30	30	40
8	30	40	40
9	30	40	40

At the points marked in the table, it was indicated that it was usually advisable to specify the next larger-sized tank. Requirements of houses having 10 or more rooms with 4 or more baths should be studied individually, since, it was maintained, better service often will be had from two units. All the recommendations made were for standard types of water heaters, with Btu inputs of from 850 to 1250 Btu per hour per gallon of tank capacity. Merchant plumbers were warned not to use a higher Btu input rate to justify a smaller-sized storage tank, since good service requires at least the minimum storage quantities given in the table. With water heaters of the low recovery type storage tanks needed to be larger than those indicated in the table, it was pointed out.

Advertising Program

While the Southern California and Southern Counties Gas Companies assisted water heater manufacturers in cooperative newspaper advertising with dealers, they featured the campaign and the advantages of rust proof water heaters in a heavy advertising and publicity program carried in consistent schedules in more than 200 daily and weekly newspapers throughout the entire territory of service.

A large number of outdoor posters, delivering an estimated four million or more messages a day, went up early in February as teasers for the campaign. With opening and intensification of the drive overlays were added announcing the sale and emphasizing the possible savings afforded. Approximately a million bill stuffers were distributed by the gas companies during the campaign, supplementing office displays, and miles of streamers and other materials were distributed to the 1200 participating plumbers for use in their showrooms.

The fact that from the standpoint of sales made during the campaign it was possible to increase an already high expectancy by half again as much lends significance to the effect of cooperation in following a well-formulated merchandising plan. Tabulation of future results would be difficult if not impossible, but there is every reason to believe that from now on an increasing number of sales will be registered in Southern California's non-ferrous column.

Fundamentals of Domestic Gas Water Heating

Bulletin No. 9 of the A.G.A. Testing Laboratories, "Fundamentals of Domestic Gas Water Heating," incorporates results of research work on this subject during the past several years under the A.G.A. Committee on Domestic Gas Research and a manufacturer's technical advisory committee of the A.G.A.E.M.

It comprises 175 pages 6¾" x 10" with many tables and charts.

Certain of the contents of this bulletin are an engineering exposition of facts and theories which have been previously available to the industry. However, much of the data are entirely new and original and should be very beneficial to manufacturers in their appliance development work and of assistance to gas companies and others in affording guides on certain installation problems.

This bulletin, together with others now in process of preparation, represents culmination of an intensive investigational program undertaken by the American Gas Association in cooperation with manufacturers for the general good of the industry and the public which it serves.

R. E. Howe, Pres. Appalachian Coals, Inc., Presents Address

R. E. Howe, president, Appalachian Coals, Inc., addressed the annual convention of National Warm Air Heating and Air Conditioning Association, on June 4th, in Chicago, Ill. Howe's subject was "Intelligent Action—Our Assurance for the Future." Convention sessions were held in the Palmer House.

The "mini" kitchen, one of the displays of "Gas Wonderland," the gas industries' exhibit group at the New York World's Fair, is a popular feature with visitors. The charm and beauty of the kitchen is shown by the above picture which discloses the modern gas ranges at the left, and the Servel Electrolux gas refrigerator at the right. Adjacent to the refrigerator is a revolving shelf which by means of a rotary movement brings all the various objects in the cupboard directly in front of the housewife. Visitors see the "mini" kitchen first through "peep" holes equipped with diminishing lenses which make the room seem as small as a room in a doll's house.

RECENT CONTRACTS

Placed with United for CARBURETTED WATER GAS APPARATUS

Seven foot U.G.I. Carburetted Water Gas Apparatus using gas oil.

Nine foot U.G.I. Carburetted Water Gas Apparatus with Automatic Control, Waste Heat Boiler, building and foundations and U.G.I. HEAVY OIL PROCESS.

Eleven foot U.G.I. Carburetted Water Gas Apparatus with Automatic Control and U.G.I. HEAVY OIL PROCESS.

U.G.I. Mechanical Generator Carburetted Water Gas Apparatus with Automatic Control, Waste Heat Boiler and U.G.I. HEAVY OIL PROCESS.

MODERNIZE—UNITED SERVICES ARE AVAILABLE

EXPERIENCE IN DESIGN: United has over 50 years' experience in gas plant design.

EFFICIENT APPARATUS: United has pioneered major developments in water and coal gas production.

ECONOMICAL CONSTRUCTION: United has large well organized forces for gas plant and general construction work.

EXPERIENCE IN OPERATION: United has experienced plant operators for securing most efficient results.

UNITED ENGINEERS & CONSTRUCTORS INC.

NEW YORK PHILADELPHIA CHICAGO

Construction and Operation of the 10,000,000 Cubic Foot Waterless Holder at Everett, Mass.

by

D. S. Reynolds

Vice President, Boston Consolidated Gas Co.

As completed, the 10 Million Cubic Foot Holder of the M.A.N. Type at Everett, Mass.

THE NEW 10,000,000 cubic foot gas holder at the Everett Plant was completed on December 10 and placed into service on December 15, 1939.

Erection of the bottom steel plating was started on July 17, 1939, so that the steel work was all erected in four months and twenty-eight days, which is a record for this size holder.

The holder is of the so-called waterless type and, instead of being circular like the older type of water sealed holders, has twenty-four sides, each of which is flat. The diameter between opposite sides is 218′-1¾″. The height to the edge of the roof is 310′-1¾″, while the total height to the top of the roof ventilator is 335′-3″. There is a light standard on the top of the ventilator which is 5′ high and the flashing beacon is 3′, so the extreme height to the top of the beacon is about 343′ above the foundation. Since the foundation is about 18′ above sea level, the top of the beacon is 361′ above sea level.

In the water sealed holder the sides of the tank are thrown into tension by the internal water pressure. The greater the diameter, the greater the pressure, and this requires a corrsponding increase in the thickness of the metal. With tanks of the same diameter, but varying depths, an increase in depth likewise means an increase in tension and correspondingly thicker plates. In large holders, this requires very thick plates and limits the size of a holder to about 10,000,000 cubic feet where the water tank is constructed of steel. Larger sizes of water sealed holders require tanks made of reinforced concrete, which of course, are not subject to the limitations of maximum plates that can be rolled, and the difficulty of proper riveted joints for the very thick plates. The steel tanks being filled with water present quite a foundation problem when bad ground conditions are encountered.

In waterless holders of the M.A.N. type, these difficulties are eliminated. The holders are made with flat sides, forming a multi-sided polygon in plan; and all sizes from 5,000,000 to 15,000,000 have the same chord lengths, and the same size and thickness of plates. The capacity is increased by increasing the number of sides, and by increasing the number of plates in the height. For example, a 5,000,000 cubic foot holder might have 20 sides, each 28.44 feet long and a total height of 219 feet, while a 6,000,000 would have the same number of sides, each 28.44 feet long, but the total height would be 258 feet. A 10,000,000 cubic foot holder would have 24 sides and a height of 310 feet 1¾″, a 12,000,000 might also have 24 sides and be correspondingly higher than the 10,000,000, or may have 26 sides, and a 15,000,000 would have 28 sides.

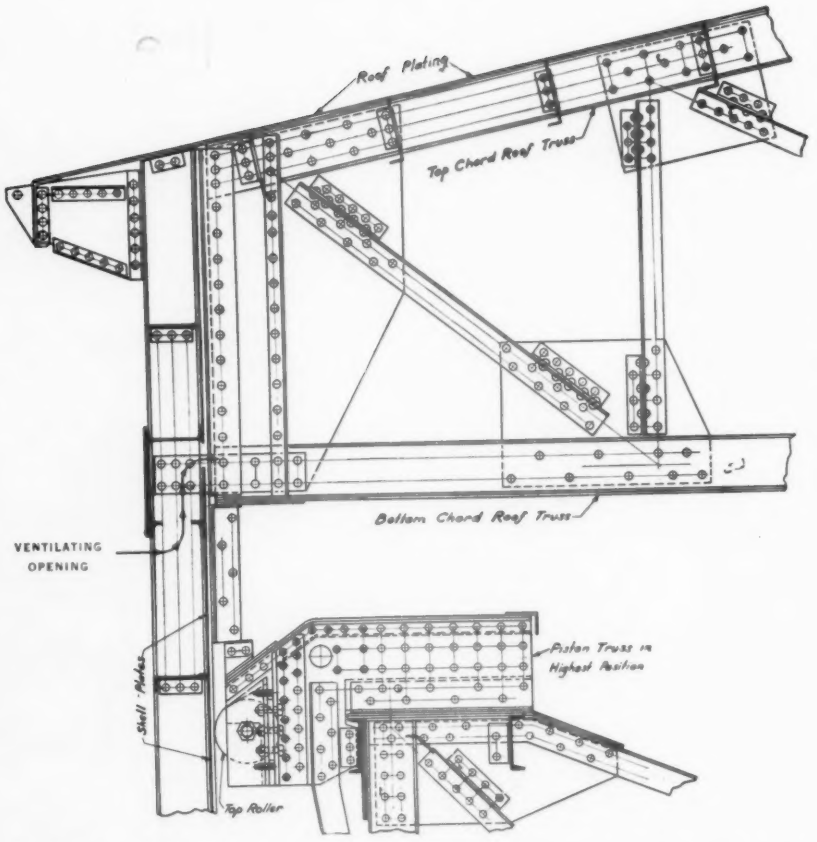
There is a difference between a water sealed holder and a waterless one, in that the pressure thrown by a water sealed holder increases as the holder rises and the different sections are lifted, while in the waterless holder, the maximum pressure is thrown when the piston is at the bottom and the pressure decreases as the piston rises. This holder throws a pressure of 10″ of water column when the piston is at the bottom and 7½″ when fully inflated.

The general scheme of construction is to bend the edges of flat plates in such a manner as to form stiffening channels along one edge, this type is used for the roof and piston plating, the flat edge overlapping the channel shape of the adjoining plate. The side plates, in addition to the stiffening channel along one edge, have the opposite edge bent to form a right angle. This projection is double-riveted to the plate below as the side sheets are assembled.

There is a column at each intersection of the side plates, which is constructed of an I-beam with inside and outside cover plates welded on to the flanges of the I-beam. The inner cover plate is flat on the inner face and is bevelled on the outer face to the slope of the intersecting sides, which are riveted to it and then welded along the vertical joints. The columns support the roof and weight of side sheets, and act as guides for the piston rollers which travel up and down on them.

The sides of the holder shell are constructed of No. 8 gauge steel, which is 11/64″ in thickness, except for the lowest ring at the bottom, which is 3/16″ thick. These sheets are formed in a special machine so that the finished plate has a horizon-

Presented at Meeting of Operating Division New England Gas Assn., Newport, R. I., June 7th, 1940.



Section through holder showing top roller in highest position. Note ventilating openings, 6 inches diameter, spaced 12 inches c. to c. around entire circumference.

tal projection of 10″ at the top, which then turns down for 3″. The bottom of the plate has a horizontal projection of 3″. The vertical height of each plate is 32½″. The bottom 3″ projection is double riveted to the bottom plate.

The next plates are assembled so that the lower 3″ horizontal projection rests on the 10″ projection of the plate below, and the joints are made as described for the lower plates. All horizontal joints are caulked to make them tight. There are 114 rows of side plates in the height of the holder.

The heavy roof trusses and the way they are attached to the columns causes the structure to act as a prismatic one, closed at top and bottom.

The wind or gas pressure (whichever is being considered) is transmitted by the shell plates, acting as beams, to the horizontal channels formed by the turned up edges of these plates, and these channels or ribs act as joists to transmit the loads to the corner of the shell. Since the horizontal ribs are about 32″ apart, it can be seen that no matter what the size of the holder might be, the same thickness of plate is required for the same loading per square foot.

If the gas pressure is 10″ of water column, the load will be $\frac{10 \times 144}{27.7}$ = 52 pounds per square foot, and the wind pressure would be 30 pounds per square foot for American practice or 52 pounds per square foot for European practice.

The ends of the ribs are connected by cover plates across the columns, as well as being welded to the column webs, and so may be considered as fixed ended.

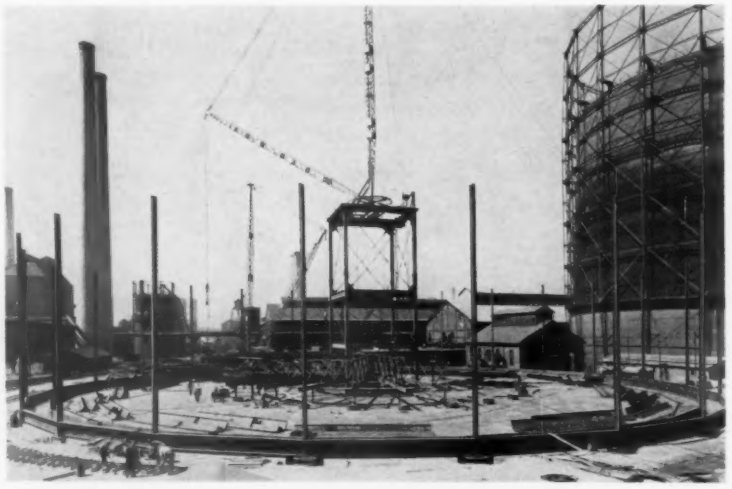
The forces acting at the rib intersections at the columns are resolved into components parallel to the ribs, inducing tension when internal gas pressure is considered and compression on the windward side of the holder when wind forces are investigated.

The columns are rigidly anchored to the foundation and the bottoms of the panels are securely connected to the bottom plates, while the roof trusses tie the structure together at the top so each panel may be considered as a uniformly loaded girder anchored at the bottom and guided at the top.

In our holder, the net uplift on a column due to the wind load is 225,100 pounds, and since 50% excess should be provided for anchorage, at least 338,000 pounds weight is needed. The maximum compression on any column base, due to live, lead, wind loads and weight of tar in the dam, is 351,100 pounds. In contrast with the water sealed holder, the weight on the bottom is only that of No. 10 gauge steel, one inch of sand and 52 pounds per square foot due to gas pressure.

When the piston is down to the bottom of its travel, its weight is taken by piers which are specially located for that purpose.

The foundation of the holder is constructed of reinforced concrete, supported by caissons at each of the



Bottom plate welded, first bottom course and lower row of columns assembled. Piston trusses being assembled.

twenty-four columns. The caisson supporting the columns are 42 inches in diameter and are belled out at the bottom to 8 feet in diameter. Plinths, which are 6 foot cubes, rest on top of the caissons and reinforced concrete marginal girders, which are 5 feet deep and 2 feet thick, connect these plinths together. Ten 1⅛ inch square rods with hooked ends are embedded for the full depth of the caissons. The outer portion of the bottom, which connects to these girders, is 18 inches thick for a width of 6 feet inwardly.

The remainder of the bottom slab is 6 inches thick, reinforced with steel wire mesh, and is supported by a fill of blast furnace slag under the greater portion of its area, which extends over the site of the old water reservoir. It was necessary to use small caissons to support the remainder of the slab, since this area was under-laid by a stratum of peat, which of course, is worthless for carrying any load. This portion of the slab was designed as a flat slab floor with two-way reinforcement. The foundation was completed in twenty-three working days.

The twenty-four columns are each anchored to the supporting caissons by two 4 inch diameter bolts, which are needed to resist the overturning forces set up by a wind with a velocity of 100 miles per hour. The bottom is flat and is made of No. 10 gauge steel welded together. The bottom is supported by 1 inch thickness of sand, saturated with gas oil, to provide a cushion. The outer edge of the bottom is sealed with cement grout and caulked with elastic cement around the edges.

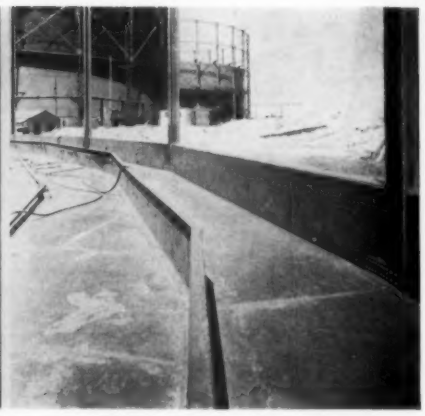
A piston which travels vertically up and down inside the shell serves to confine the gas within the holder. The piston is a trussed structure, consisting of twenty-four radial trusses, the bottom of which is covered with steel plating 11/64" in thickness, which is riveted and welded at all joints. The outer end of each of the radial trusses is increased in depth to about twenty-one feet. Rollers are placed at the top and bottom of each truss, so there are twenty-four top rollers and the same number of bottom rollers. All rollers work up and down on the faces of the steel plates which are welded to the inner flanges of the I-beams which make up the columns. At two points, diametrically opposite, there are steel guides provided to prevent the piston from rotating. Three hundred tons of concrete blocks were used to increase the weight of the piston in order that it might throw a pressure of 10 inches of water column at the bottom.

The piston is made tight by a tar seal, which extends around its circumference. The tar seal may be generally described as a deep trough around the edge of the piston. This trough is called the cup. Flexible steel bars, called rubbing bars, are placed around the inside of the holder shell and are forced into close contact with the shell by a large number of weighted bell-crank levers. A double thickness of heavy canvas connects the steel rubbing bars to the bottom of the tar seal. This permits a certain amount of flexibility as the piston moves up and down, and as the canvas is carefully protected from rubbing against the steel, its life should be very long. A special shoe is used at the columns to connect the rubbing bars in each bay to the next. Twelve vertical partitions, which are also made to fit closely to the shell by means of weighted levers, divide the tar cup into compartments to prevent the tar from running from one compartment to another.

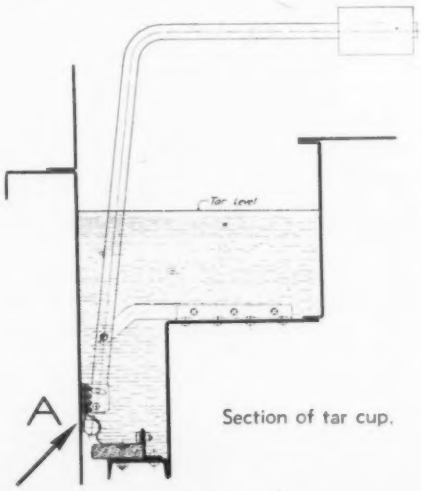
The cup is filled with tar so that it is 17½ inches to 19½ inches deep over the top of the rubbing bar. This level results in the tar being 1½ inches to 3½ inches above the partitions and assures free flow of tar around the periphery of the cup. This seal absolutely prevents any gas from blowing by the piston. The tar that leaks by the rubbing bar runs down the sides of the holder shell to the tar dam, which is a container 2 feet deep by 5 feet 3½ inches wide around the inside of the holder at the bottom. Overflow weirs are provided in the dam to maintain a constant level, as well as skimming devices to skim the water and wet tar from the top of the dam. The tar runs from this tar dam to tar seal tanks from which it is pumped by electrically operated pumps, each located in a compartment adjacent to the tar seal tank. Our holder has six seal tanks, equally spaced around it.

The tar from the dam at the bottom of the holder flows into the seal tanks through connections having adjustable weirs, and when the tar in the float chamber raises the float to a certain level, the float switch

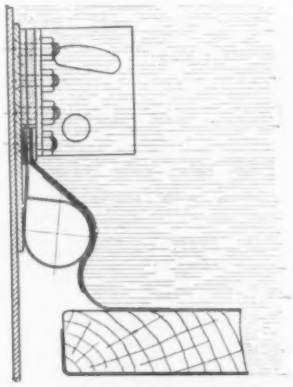
Left—Center frame of piston trusses.



Right—Assembly of tar dam.



Section of tar cup.



Enlarged section at A.

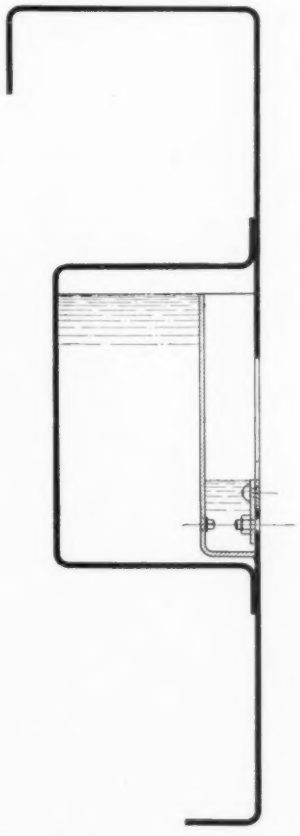
automatically operates the pump and transfers the tar through riser pipes outside the holder to the overhead tar distributor from whence it flows down the shell to the tar seal cup on the piston. Sealed overflows are provided to control the level of tar in the cup. These pumps are equipped with counters, so that the number of pump runs may be recorded. These records play an important part in the operation of the holder since they indicate whether or not conditions are normal within the holder.

The water and surface skimmings from the tar dam flow through adjustable overflows to a common header pipe connecting the six tar seal tanks to the 6,000 gallon skimmer tank, which is a rectangular tank with three compartments and adjustable overflow weirs where the water is separated from the tar. A float switch operated motor driven pump draws the tar from the settling tanks and delivers it to the dam in the holder. On top of the skimmer tank is a tar conditioner, so that any water or light oils may be distilled from the tar by steam heat when necessary. The skimmer tank pump is used to deliver tar to the conditioner. This holder requires 58,000 gallons of tar for the tar cup and dam. This tar is made from water gas tar and should have a specific gravity of about 1.04 @ 60°F. Water content = trace, acids below 1%.

Distillation—First Drop	=	about 200°C. (to eliminate styrene
First Drop to 235°C.	=	below 1% and indene)
235°C.-270°C.	=	below 12%
270°C.-300°C.	=	about 30%
Residue	=	about 60% and soft.
Viscosity (Saybolt Furol) 50°F.	=	about 300 seconds
100°F.	=	about 30 to 33 seconds

In the sides of the shell, near the top of the holder are located a series of holes 6 inches in diameter, which together with the ventilator in the center of the roof, allow the air to escape as the piston rises or to admit air as the piston descends.

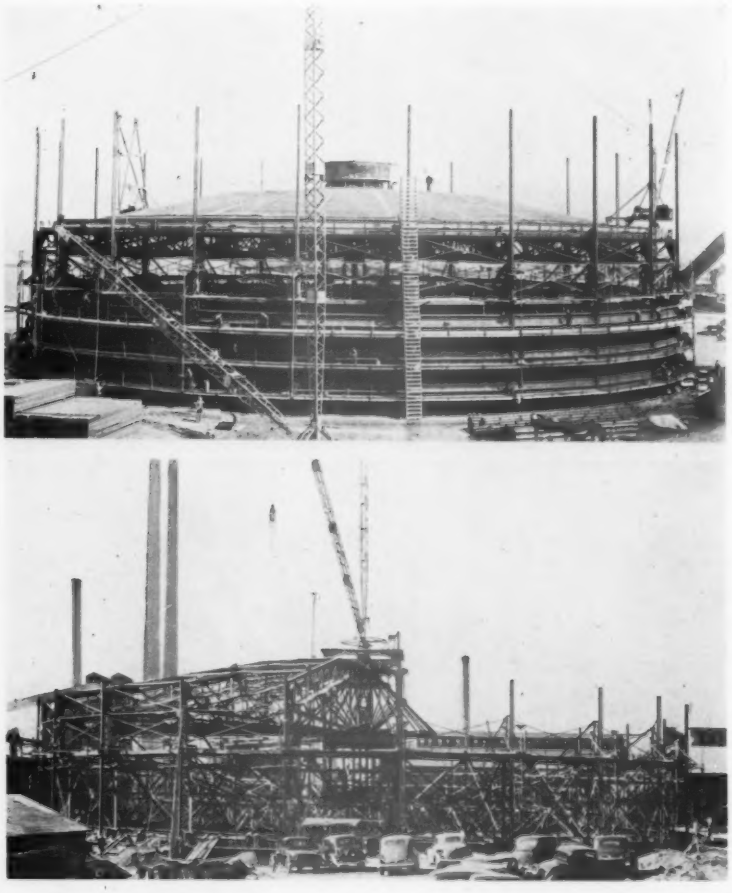
Near the top of the holder shell, circular blow-offs are provided so that when the piston reaches its maximum travel, the excess gas will be blown to the atmosphere to prevent damage to the holder. Since these blow-offs will discharge 2,000,000 cubic feet per hour, it is important that care is taken to prevent over-travel of the piston.



Section through tar distributor.

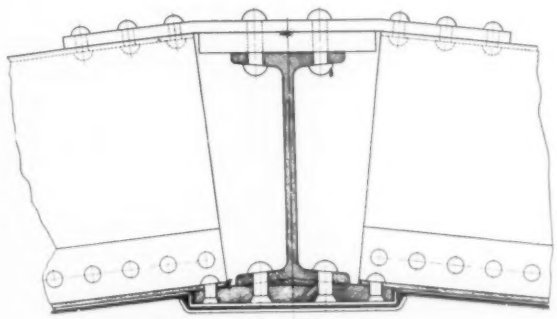
A safety seal is provided over the outlet pipe, so that if the piston grounds, the exhauster will be unable to create a vacuum beneath the piston. This seal consists of a steel plate ⅜ inch in thickness, somewhat larger in diameter than the outlet pipe, suspended by chains to the piston and located directly over the outlet pipe in the bottom of the holder. When the piston nears its lowest position, this plate lands on the outlet pipe and so shuts it off. A capacity indicator, which is in reality the counterweight of the inside elevator guide cables is provided with a pointer which indicates the quantity of gas in the holder on a scale located on the face of the housing of the counterweight near the ground.

The gas is admitted through two 48 inch diameter steel pipes, which



Upper:—Several side courses in place, roof plating welded, roof derricks erected, getting ready for first blow.
Lower:—Roof trusses being assembled.

extend a few inches above the bottom. A 48 inch pipe leads to the gas boosters used for pumping the gas to Boston. The 48 inch valves are operated by electric motors. The gas fills the space between the piston and the bottom and its pressure causes the piston to rise. Each foot that the piston rises means a storage of 36,950 cubic feet. The total travel of the piston of 271 feet 11¼ inches gives a storage of 10,048,000 cubic feet.



Section through shell column and rubbing bar. The method of fastening the shell sheets to the column is indicated.

To safeguard the holder from airplanes flying into it at night or in the fog, as well as to provide a navigation marker for their flights, it is equipped with a lighting system conforming to the regulations of the Civil Aeronautics Authority. This consists of a 1000 watt red flashing beacon at the center of the roof, twelve 100 watt red fixed lights around its circumference and six similar lights around the second gallery from the roof. These lights are turned on and off by a photo-electric cell operated by the daylight.

There is painted horizontally on the roof, an arrow pointing to the airport 2 miles away, the word EVERETT in letters 21 feet long, and MASS. in letters 14 feet long. This marking is in international orange and black on an aluminum background.

At night these signs are illuminated by three 500 watt flood lights.

The top section of the holder is painted in alternate squares of international orange and white. This combination has been found by the government to give the greatest visibility in a fog.

In erecting the holder the first step was to assemble the bottom plates on a 1 inch layer of sand, thoroughly saturated with gas oil. The plates were welded together along the overlapping edges. The inlet and outlet tees were installed and the bottom plates welded to them. A four-posted steel tower was erected on special concrete foundations that had been constructed when the foundation was built. The tower was 64 feet 6 inches high and the columns were 25 feet on centers. It was rigidly braced by horizontal struts and diagonal ties. On top of the tower a 12 ton steel guyed derrick with a mast about 127 feet high and a boom about 113 feet long was erected. The hoisting ropes were led to a gasoline driven hoisting engine located on the ground outside the bottom of the holder.

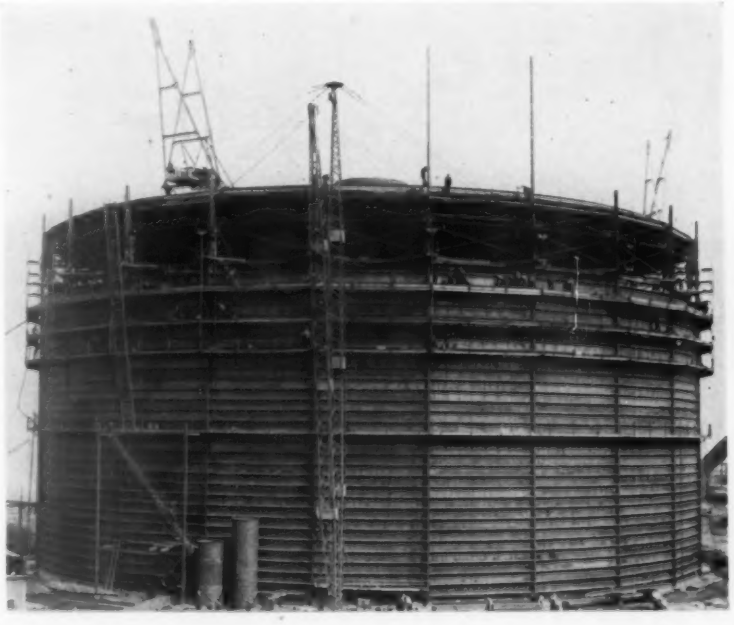
This derrick was used to assemble the 24 radial piston trusses and the first section of the outside columns. The piston plating of No. 8 gauge steel was riveted and welded to these trusses and to each other. The tar dam sheets were welded to the bottom plates and the first rows of side plates riveted and welded after the columns had been properly plumbed.

The roof trusses were next assembled on top of the piston trusses and the No. 12 gauge roof plates welded on. These roof plates were assembled and welded together, six at a time, on the ground and the large sections hoisted into place. A circular track consisting of a single rail was laid around the outside edge of the roof. Two roof derricks, which ran on this rail, and which were guyed back to the center of the roof were erected. The center derrick and its supporting tower were taken down, and steel plates welded over the openings in the bottom, after the bolts which anchored the tower columns had been cut off.

The radial roof derricks set the side sheets in place, the plates being brought to the proper bay by means of special rail trucks, which were pulled along a circular track built around the base of the holder.

A temporary seal, consisting of canvas belting was assembled around the cup, bent downwards along its length, in such a way that the air pressure would force it into contact with the shell of the holder and reduce air leakage. Two electrically driven, centrifugal compressors were connected to one of the inlet pipes, and the other inlet and outlet closed off.

Upon the outer end of each piston truss a special frame embodying a strong dog or ratchet was erected. The outer ends of these dogs would bear upon steel rest blocks, which were clamped to the columns, and also supported by 24 steel pins in-



Holder in process of erection: note scaffolding and lower section of elevator shaft.

serted through holes in each block and engaging the two vertical rows of holes in the inner flange plates of the columns. Two rows of these blocks were used, one set being 32½ inches above the other. Extensions from these frames supported multiple decked scaffolds around the entire circumference of the holder. These scaffolds were hinged so that they might clear the five projecting galleries, which were placed about 59 feet apart vertically. After nine vertical rows of side plates had been erected, the second row of rest blocks was set in place and the piston, carrying the roof and radial roof derricks, was raised by pumping air under it until the dogs engaged the rest blocks. The scaffold, of course, rose with the piston.

The upper set of rest blocks was then set 32½ inches above the lower, and a ring of side plates erected, when the holder was again blown and the operation repeated. When a section of vertical column had to be set, the roof derricks performed this work, and so on until 114 courses of side plates had been erected. Men on the top deck of the scaffold assembled side plates while riveting and caulking proceeded on the lower ones.

The circular shaft of the outside elevator, and the stairs were also carried up as the erection proceeded. When all side plates were erected, the roof trusses were riveted to the columns, the machinery for both outside and inside elevators and hand hoist placed in position, then the roof derricks were taken down.

The permanent seal was then put in place of the temporary seal and the piston lowered to the bottom.

Adjustments were made on the rubbing bars, seal levers, and guide rollers, and then the tar used for sealing was pumped into the cup through a manhole in the side of the shell just above the piston. The gas connections were made and the space between the piston and the bottom of the holder purged of air by means of inert gas produced by an inert gas generator using manufactured gas for fuel. This generator had a capacity of 35,000 cubic feet of inert gas per hour.

The inlet valve was then opened and the inert gas purged out. As soon as the space was filled with pure gas, the purge pipes were removed, the manholes sealed and the piston was allowed to rise and the holder was in commission.

The erection record is as shown in the table above:

The inside of the roof and the roof trusses are painted with aluminum paint, as is the upper part of the shell above the tar distributors. The piston trusses are also painted with aluminum paint, while the piston itself is black.

The outside of the holder is painted with one coat of red lead, then a second coat of blue lead and a finish coat of dark slate gray. The holder roof, ventilator and penthouses are finished in aluminum. The inside of the outside elevator shaft is also painted with aluminum paint. The aviation markings, etc., are painted on top of the finish coat.

Erection Record

		Lost Time		Number of Men	
	Dates	*Days*	*Hours*	*Minimum*	*Maximum*
Bottom Started	7/17/39	1	0	26	100
Piston Trusses Erected	8/28/39	3	7½	100	127
Roof Trusses Erected	9/14/39	1	3	100	137
First Blow	9/27/39	5	2½	100	172
Last Blow	11/6/39	2	0	125	164
Piston Landed	11/21/39	1	0	52	116
Tar Test Complete	12/7/39			43	43
Ready for Gas	12/8/39			42	42
Gas in Holder	12/14/39			25	25
Job Completed	12/14/39				

Completed in 4 months, 28 days. Total number of blows 99. Average per 8 hours, 4.363 blows. Total lost time, 14 days, 5 hours.

Advantage of the M. A. N. Holders

1. Lower first cost when large size holders are considered.
2. Cheaper foundations, particularly where adverse ground conditions are encountered.
3. More rapid construction than is possible in a water sealed holder of equal size. Sometimes this is a very important advantage.
4. No troubles caused by cupping and uncupping of holder sections.
5. No cups or water seals to freeze or corrode.
6. No problem of heating the water in cups and tank in cold weather. The tar used for sealing may have to be heated at times and for this purpose steam heaters are inserted in the lowest side plates to heat the tar in the dam.
7. Never necessary to shovel snow from the roof, as the roof is amply strong to support the weight of the snow and it does not affect the pressure thrown by the holder.
8. Larger capacity holders may be built on the same area than would be possible with water sealed holders.
9. Painting cost is much less, since the holder never descends into water, the interval between paintings is about twice as great as is required with water sealed holders.
10. The inside of the shell is always coated with tar and so is well preserved.
11. All plates having gas on one side and air on the other are considerably thicker than is the case in water sealed holders. This indicates a longer life for the waterless holder.
12. All parts of the holder are accessible for inspection. There are manholes in the piston decking so that even the space below the piston may be inspected when the piston is landed and the space between it and the bottom purged out.

Operation of the Waterless Holder

Close inspection of the seal must be made, the number of pump runs recorded and checks made to be certain that the viscosity of the tar is correct and that the water content is kept below 3%.

Our normal schedule is as follows:

During the winter weekly inspections are made. An inspection crew consists of 3 men.

1. **Each week measure tar levels.**
2. **Each week measure piston tilt.**
3. **Each week inspect rollers.**
4. **Each month gage guide block clearances with steel feelers.**
5. **Observe general conditions and report irregularities immediately to plant foreman.**
6. **Check operation of manual lift.**
7. **Every three months, each member of both crews are to be lifted to top by use of hand operated lift.**

In summer, these inspections are made every other week. Each day, at the end of each 8 hour shift, the pump counters are read and recorded as is also the skimmer tank pump

(Concluded on page 44)

CURRAN-KNOWLES GAS AND COKE OVENS

Successfully carbonize Low Volatile, High Volatile, Swelling or Non-Swelling Coals.

Give a high yield of superior quality coke for water gas generator fuel, industrial and domestic use; a high yield of tar of excellent quality and a uniform quality of gas which meets Commission requirements.

Top of Ovens Curran-Knowles Plant in British Columbia, Canada, where low volatile expanding coal is carbonized.

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STEEL PLATE CONSTRUCTION

AMBLER, PA.

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RIVETED OR WELDED FABRICATION & ERECTION

TANKS, BINS, FLUES PURIFIERS, WELDINGS

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You Take No Chance on "Clevelands" for They Are Sold On a Guaranteed Satisfaction Basis.

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REYNOLDS offers greater Capacity—Increased Range—Quicker Response—all features of REYNOLDS Gas Regulators for Industrial Control. They assure smooth, constant outlet pressure and volume. Manufactured in single or double valve construction, REYNOLDS Industrial Regulators are proved by performance in factory tests and on installations throughout the world.

REYNOLDS Cooperation in solving Gas Control Problems is always available. Write.

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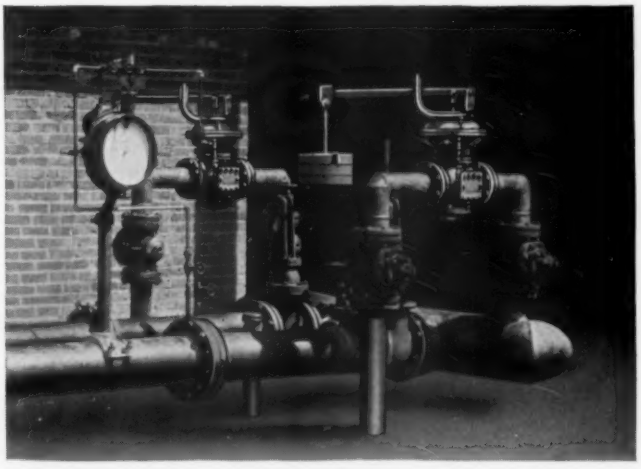


REYNOLDS GAS REGULATOR CO.

ANDERSON, INDIANA, U. S. A.

A Study of the Theoretical Advantages of Low Air: Steam Ratios in the Manufacture of Blue Gas and Carburetted Water Gas

By

J. H. Taussig, Jr.

The Philadelphia Gas Works Co.
Philadelphia, Pa.

IN THE DATA published in the last 40 years on Water Gas and Carburetted Water Gas, almost every author states that CO_2 in the gas is undesirable. In the days when the candle power standard was in effect, there was a great incentive to reduce the CO_2 in the gas as for each 1% reduction in CO_2, there was an increase of from 3% to 4% in the candle power. Now the candle power standard has passed and CO_2 in the Water Gas is no longer a detriment in most cases.

The four reactions taking place in the generator during the run period are:

(1) $C + H_2O \rightarrow CO + H_2$ — 70 900 B.t.u.
(2) $C + 2H_2O \rightarrow CO_2 + 2H_2$ 71 600 B.t.u.
(3) $CO + H_2O \rightarrow CO_2 + H_2$ — 700 B.t.u.
(4) $CO_2 + C \rightarrow 2CO$ — 70 200 B.t.u.

The above reactions are all endothermic in going as indicated. Although various authorities agree that they are the reactions that do occur in the decomposition of steam by incandescent carbon, they disagree on their exact mechanism. Therefore let us consider each reaction separately. Actually reactions (1) and (2) represent the sum total of all the run reactions but reactions (3) and (4) are included as they may be useful in illustrating several points. The carbon per M and per MM B.t.u. calculated for these four reactions does not include the heating of the fuel bed but only the carbon in the Water Gas.

Reaction (1) $C + H_2O \rightarrow CO + H_2$ — 70 900 B.t.u. In this reaction, one mol of carbon and one mol of steam form one mol of CO and one mol of H_2. Water Gas, if made entirely from this reaction and without diluents would be of approximately 318 B.t.u. per cu. ft. and would require 15.8 lbs. of carbon per M of gas. The carbon per MM B.t.u. would be approximately 49 lbs.

Reaction (2) $C + 2H_2O \rightarrow CO_2 + 2H_2$ — 70 600 B.t.u. In this reaction one mol of carbon and two mols of steam form one mol of CO_2 and two mols of H_2. Water Gas, if made entirely from this reaction, would be of approximately 213 B.t.u. per cu. ft. and would require 10.5 lbs. of carbon per M of gas. However, the carbon per MM B.t.u. would be approximately the same as reaction (1).

Reaction (3) $CO + H_2O \rightarrow CO_2 + H_2$ — 700 B.t.u. In this reaction, one mol of CO and one mol of steam form one mol of CO_2 and one mol of H_2 with the absorption of 700 B.t.u. The Fuel in the gas per MM B.t.u. remains unchanged by this reaction but there is a reduction of the fuel in the gas per M of gas made.

Reaction (4) $CO_2 + C \rightarrow 2\,CO$ — 70 200 B.t.u. In this reaction, one mol of CO_2 and one mol of carbon form two mols of CO. This reaction represents a reduction of CO_2 formed by either or both reactions (2) and (3) and increases the fuel in the gas.

From the above reactions, it can be seen that as far as the carbon required in the Water Gas per MM B.t.u., reactions (1) and (2) are practically the same and reactions (3) and (4) have little effect.

But it is also apparent that the carbon in the gas per M is less for reaction (2) than reaction (1) as stated above. Reaction (3) reduces the fuel in the gas per M of gas and reaction (4) increases the fuel in the gas per M of gas.

Therefore it can be seen that, thermally, high CO_2 in the Water Gas is not necessarily detrimental to Water Gas efficiency as far as the run is concerned.

The following reactions occur during the blow:

(A) $C + O_2 \rightarrow CO_2 + 174$ 600 B.t.u.
(B) $C + CO_2 \rightarrow 2CO$ — 70 200 B.t.u.

Reaction (A) is exothermic and supplies the heat for the run reaction (1), (2), (3) and (4) as well as for reaction (B) which is endothermic.

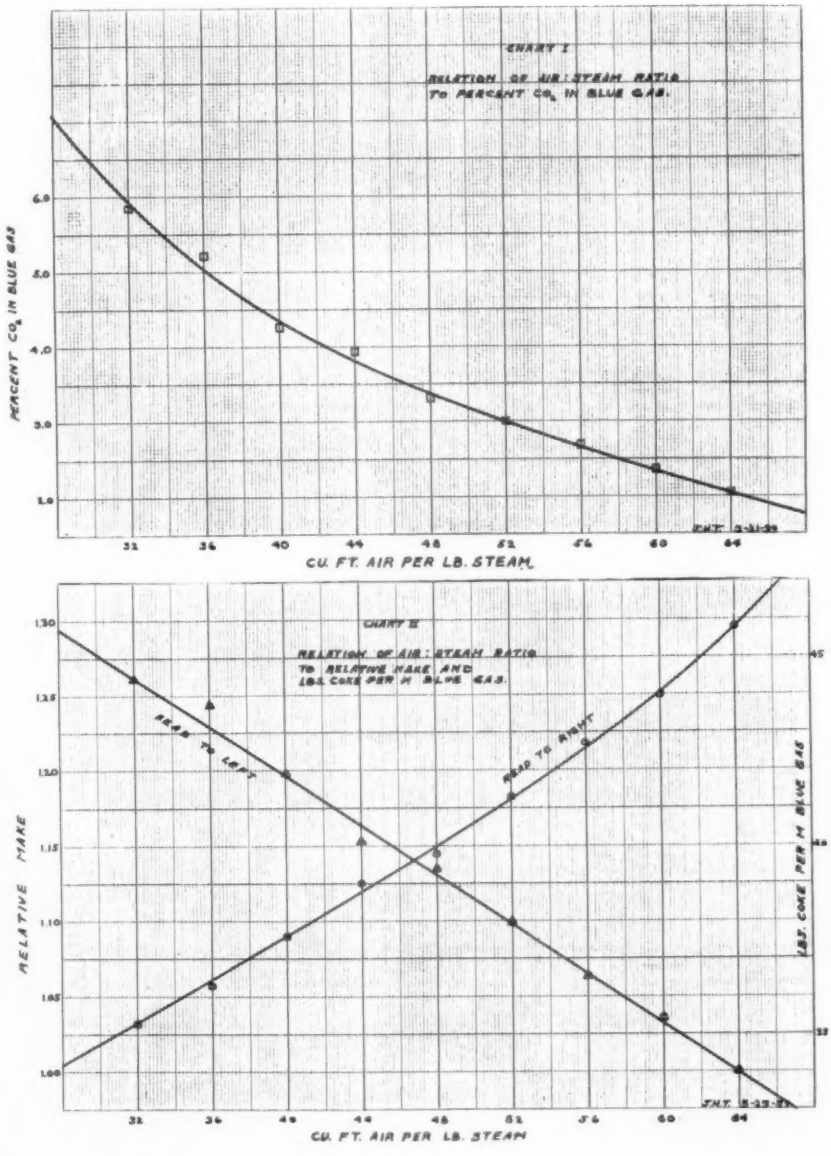
In the Water Gas Generator, reaction (A) takes place practically completely in the lower portion of the fuel bed. As the CO_2 formed progresses up through the incandescent fuel, some of the CO_2 is reduced to CO as shown in reaction (B). This reaction takes heat and carbon from the upper portions of the fuel bed, the potential heat of the CO equal to the heat of the carbon removed plus the heat removed from the fire.

Therefore, as far as heat storage for the run reactions is concerned reaction (B) should be retarded. Low time of contact and low temperatures, especially in the upper portions of the fuel bed, are the means of keeping reaction (B) at a minimum. Low fire temperatures will also reduce the sensible heat losses from the fuel bed. The sensible and potential heat losses during the blow cannot be estimated exactly, due to the uncertainty of fire temperature, temperature of exit blow gases and amount of CO_2 formed at various air:steam ratios but it is evident that they are very considerable, both in fuel per MM B.t.u. and fuel per M of blue gas.

The condition that promotes reaction (2) is a low fire temperature. Low fire temperatures, especially in the upper portions of the fire, will retard reaction (4) which is undesirable from the standpoint of generator fuel consumption per MCF.

However, high CO_2 in blue gas in itself does not necessarily indicate efficient blue gas production. In fact, probably in many cases high CO_2 has accompanied reduced capacities and higher operating costs and the operator has noticed this connec-

Presented at American Gas Association Technical Section, Joint Committee Conference of the Production and Chemical Committees, Hotel Pennsylvania, New York, N. Y., May 20-22, 1940.



tion and therefore worked for at least a reasonably low CO_2, the method of obtaining the desired CO_2 being the control of the air-steam ratio.

In general CO_2 in the blue gas is formed by weak fires, cold fires, or a combination of both. Weak fires, either hot or cold, are undesirable both for capacity and efficiency. Due to insufficient fuel depth, a great deal of the heat of the reactions during the blow will appear as sensible heat in the products of combustion as this sensible heat will not be extracted in the upper portions of the fire. Then, on the steam run, due to insufficient time of contact and heat storage, much of the steam will pass through the fire undecomposed, causing excessive heat losses in the sensible heat of the undecomposed steam.

Weak fires are caused by the improper relation of the up and down steam for the air-steam ratio in use. With a low air:steam ratio, the average fire temperature is relatively low. If an insufficient percentage of the total steam is not sent down through the fire, the primary oxidation and reduction zones slowly creep up through the generators, reducing the effective depth of the fire and increasing the combustible loss in the ash. "Black eyes" appear near the walls if this condition is very pronounced, the results: low steam decomposition, low capacity and poor results. Raising the air:steam ratio, will partially correct this condition. By raising the average fire temperature, although the percentage of down steam remains the same, there is more heat available to be returned to the base of the generator on the down run and the oxidation zone is "pushed" down to the base of the fuel bed.

Considering the average fire temperature, however, will reduce the percentage of CO_2 in the blue gas and increase the generator fuel per MCF, but by keeping a low air:steam ratio and increasing the percentage of down steam sufficiently to keep the primary oxidation zone at the base of the fuel bed, high CO_2 becomes an indication of good blue gas efficiency.

Now let us consider the advantages and disadvantages of low B.t.u., high capacity and efficiency. Due to insufficient fuel depth, a great deal of the heat of the reactions during the blow will appear as sensible heat in the products of combustion as this sensible heat will not be extracted in the upper portions of the fire. Then on the steam run, due to insufficient time of contact and heat storage, much of the steam will pass through the fire undecomposed, causing excessive heat losses in the sensible heat of the undecomposed steam.

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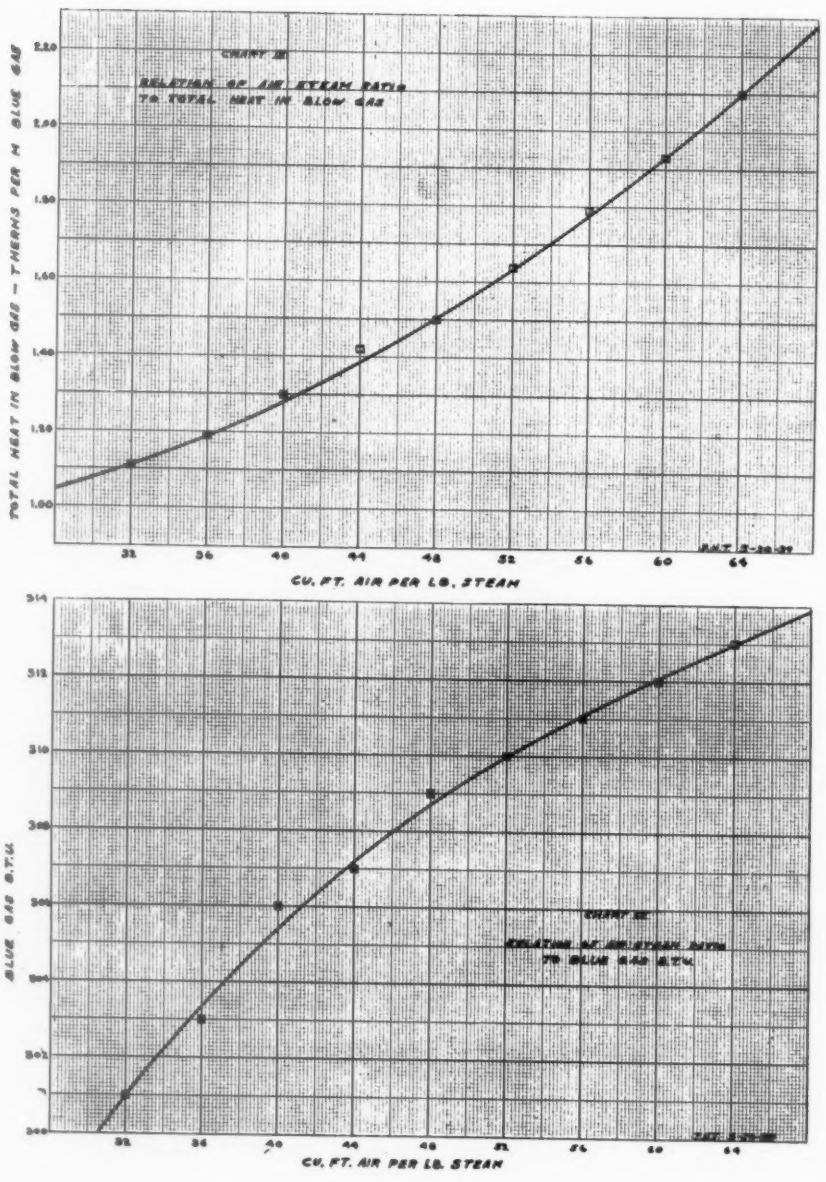
Now let us consider the advantages and disadvantages of low B.t.u., high CO_2 blue gas. On the Atlantic Seaboard at the present time, generator fuel is relatively high in price

Chart 1 shows the relation between the air:steam ratio and the percentage CO_2 in the blue gas.

Chart 2 shows the relation between the air:steam ratio and the relative make and also the relation between the air:steam ratio and the pounds of coke per M of blue gas. The two curves of this chart show very plainly the increased capacities obtainable and the savings in generator fuel with a lower air:steam ratio.

Chart 3 shows the relation between the air:steam ratio and the heat in the blow gas. It shows the heat savings in sensible and potential heat of the blow gas for the lower air:steam ratios.

Chart 4 shows the relation between the air:steam ratio and the blue gas B.t.u.



as compared to the residual oils. In many plants in this area, blow run gas is used to lower the generator fuel consumption, increase the carburetting oil per M and increase capacity. Also, some of the carburetting oil is reformed, further decreasing the generator fuel, increasing the carburetting oil per M and lowering the specific gravity of the resulting gas. Blow run gas in itself is not as "cheap" a gas per MM B.t.u. as oil gas from heavy oil. However, when carburetted with residual oil, the resulting mixture is relatively inexpensive, i.e., less expensive than low CO_2 carburetted blue gas. If the blow run gas is replaced wholly or in part by inert CO_2 made by the Water Gas reactions (2) and (3) instead of air gas made on the usual blow run, there will be an additional reduction in the cost of the finished gas.

There is an added advantage of supplying inerts by this method as the specific gravity of the carburetted Water Gas made from reaction (2) will be less than if reaction (1) and blow run gas are used.

Now, let us list the results desired from a carburetted Water Gas Set and see how they may be obtained.

(I) Good operating results.
(II) High capacity.
(III) By-product tar with a minimum amount of free carbon.
(IV) Low labor costs.

Good operating results with a price differential in favor of oil over coke require low generator fuel and relatively high oil. If the tar is worth more than boiler fuel, a high tar yield is desirable for the lowest overall cost including gas price and tar credit. A high tar yield will raise the gas cost but if there is a demand for the tar at a price above the cost of residual oil plus tar dehydration, low oil efficiency (e.g. high tar yield) is indicated. With a price differential in favor of generator fuel over oil, then the market for tar will be the controlling factor as to high or low tar yield but there will still be the incentive, in either case, to keep the generator fuel at a minimum if it can be done without affecting the oil efficiency desired.

Low fire temperatures promote the saving of generator fuel both on the make and on the blow. But as low fire temperatures reduce the actual percentage of oil that is reformed on passing through the fire, the amount of backrun oil must be increased. In present heavy oil practice the oil vapors are reformed during the backrun, i.e., after making an up run. Therefore the fire temperatures are low enough, especially with low air:steam ratios, so that oil vapors are not cracked in space. A higher percentage of total oil reformed means a lower B.t.u. finished gas, further decreasing the generator fuel by more carbon being deposited in the fire and a larger percentage of the finished gas being oil gas. Low fire temperatures give a low B.t.u. Water Gas, also requiring more oil for carburetion.

High capacity requires as high a blast rate as possible, limited by the blowing of fuel out of the fire. To maintain a low air:steam ratio with a high air input, a high steam rate is required. A high steam rate will give a relatively high steam rate:oil injection rate ratio, which is conducive to reducing degradation of the tar, especially when a large percentage of the total oil is reformed as a high concentration of steam, and high velocity of steam, blue gas and oil vapors reduce the time of contact and

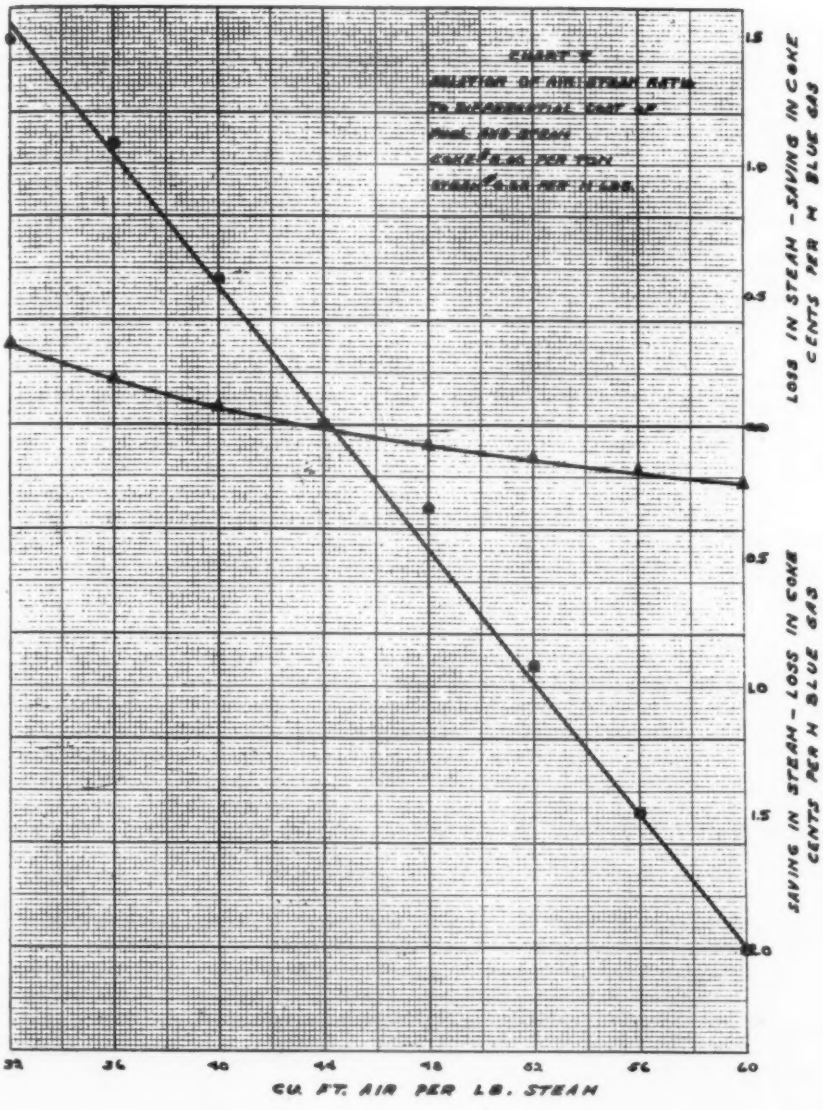


Chart 5 shows the differential between the cost of steam and cost of coke per M of blue gas at various air:steam ratios. It was calculated on the basis of coke at $8.00 per ton and steam at $0.25 per M pounds.

the amount of oil reformed in space.

From the standpoint of generator fuel consumption, the lowest air:steam ratio that can be used and still supply sufficient heat for oil vaporization and fixing is the most economical as the lower air:steam ratios make cooler fires and promote reaction (2) and retard reaction (B). There is, however, the cost of the steam to be considered. The most economical point of operation may be found by plotting the cost of steam against the air:steam ratio and the cost of fuel against the air:steam ratio and selecting the air:steam ratio at which the sum of the two costs is a minimum.

Literature pertaining to heat balances and fuel required at various air:steam ratios is conspicuous by its absence. The only data available to this writer are given in "Communication No. 122 of the Institution of Gas Engineers' 37th report of the Joint Research Committee of the Institution and Leeds University. The Controlled Operation of a Carburetted Water Gas Plant—Part II." These data, due to differences between American and British practice, should probably not be taken as quantitatively exact; but there seems to be no reason that they should not be qualitatively indicative of American apparatus and conditions. The curves shown are plotted from these data. Coke was the generator fuel used in the English tests.

The curves show decided advantages for the lower air:steam ratios for blue gas. To how low a point the air:steam ratio may be reduced in carburetted Water Gas manufacture is a problem to be solved by trial. The trend of these curves indicates that it can be carried considerably below the lowest limit of the English tests. This empirical data check the theoretical considerations very well.

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1940 A.G.A. Hotel, Restaurant and Commercial Sales Conference

New Small Appliance Display and Workable Plans For Putting Them on Your Lines Featured

THE 1940 Hotel, Restaurant and Commercial Gas Sales Conference, sponsored by the A.G.A. Industrial Gas Section was held at Atlanta, Ga., May 30 and 31. In connection with the meeting, and discussed from the floor by several speakers, was the most impressive display, confined exclusively to modern small gas appliances for commercial uses—for kitchen and counter cooking, for coffee making, for 180° water heating, for dishwashing and sterilization, for refrigeration, for permanent waving, etc. Twenty different manufacturers had each supplied one or two of their newest and most ingenious units for making the commercial enterpriser's life easier and more profitable—and it was apparent that the years of agitation for better small appliances for business purposes, which have characterized A.G.A. Hotel, Restaurant and Commercial Gas Sales Conferences since their beginning in 1933, had brought results—that something has happened in the small appliance field—that non-residential gas sales departments now have a most professional "kit-of-tools" with which to build high-rate, good-load-factor, big-volume commercial gas loads.

To consolidate the Conference's evaluation of each unit, and to bring out the sales points of each piece of equipment, a grand "Parade of Stars" among small commercial appliances, brought individual tables of interesting new units in the same classification across the stage and under the spotlight, where Harry A. Sutton, Newark, N. J., Arthur M. Apmann, Derby, Conn., E. V. Finer-an, Washington, D. C., and Charles W. Gale, Knoxville, Tenn., held extemporaneous discussions emphasizing the merit of each *from the gas utility salesman's point of view.* Specially considered in this Parade were groups of: (1) deep fat fryers, (2) counter griddles, (3) broiling-grilling combinations, (4) latest-type urns and coffee makers, (5) warming cabinets, (6) dry steam tables, (7) continuous and pop-up toasters, (8) hot dog warmers, oysters stewers, and other specialties, and (9) batch sterilizers. By way of introduction to this demonstration, a prepared round-table discussion led by Mr. Apmann aired the viewpoints of different companies in regard to special phases of marketing technique and dealer cooperation.

News on the Sterilization (180° Water) Front

Another symposium — this on "Selling Points for Volume Water Heating," and involving the matter of 180° water supplies for dishwashing and sterilization—featured the first day of the Conference. W. H. Ligon, Atlanta, emphasized the desirable load characteristics of water heating business, noting that its hour-to-hour as well as its month-to-month fluctuation is minimal and can, to some degree, be controlled to balance other peak-and-valley influences. Analyzing a representative Southern city, he demonstrated that there were several hundred undeveloped prospects for commerecial water heating service, and showed that they might fall into as many as 20 or 30 different classifications. His conclusion was that this phase of the commercial gas load, despite its desirability and salability, has not yet been favored with the sales aggressiveness which it merits.

A. V. Leudemann, New York, representing the Volume Water Heating Committee of the Industrial Gas Section, distributed the new report of that Committee on "180° Water Heating at N. Y. World's Fair"; and reviewed its contents to demonstrate that many *new* techniques for dishwashing and sterilizing - water production have been devised on the Fair Grounds. Some of these methods were described, and the commercial gas sales fraternity was urged carefully to study the report so that its knowledge of modern steriliza-

AT THE THURSDAY LUNCHEON

(l to r) E. L. Stauffer, South Carolina Power Co., Charleston, S. C.; Hale A. Clark, Michigan Consolidated Gas Co., Detroit, Mich.; E. J. Stern, Vice President, Georgia Public Utilities Co.; Franklin T. Rainey, Chairman, Industrial Gas Section, American Gas Association, Columbus, Ohio; Eugene D. Milener, Secretary, Industrial Gas Section, New York, N. Y.; H. Carl Wolf, Vice-Chairman, Industrial Gas Section, Atlanta, Ga.; Charles C. Krausse, Consolidated Gas Electric Light & Power Co., Baltimore, Md.; Robert J. Wilson, Field Secretary, National Restaurant Association: and John F. Mooney, Standard Gas Equipment Corporation, Orlando, Fla.

Eugene J. Stern, Vice President, Georgia Public Utilities Co., addressing the Thursday luncheon.

tion techniques will not be outdated as the trend toward more stringent municipal enforcement of sanitization laws gathers speed.

Final contributor to the Water Heating Symposium was Walter G. Groth, Toledo, who described the modus operandi of the one-year-old booster-recovery system by which a single appliance can supply both large quantities of stored 140° water for general utility, as well as adequate quantities of 180° water for the operation of sterilization or dishwashing apparatus. Aside from the flexibility of such hook-ups, extra virtues lie in the fact that there is no temperature-stratification in storage tanks, and smaller storage tanks can be used than with traditional storage systems wherein gravity rather than a pump is relied upon for recirculation. Groth urged that our energies be applied to sales of new installations rather than wasted in boasting about jobs in the emergency breakdown replacement classification.

Commercial Cooking Moving from Kitchen to Counter

Eugene J. Stern, Vice-President, Georgia Public Utilities Company, dared the indictment that "a great proportion of commercial cooking business has been moving from the kitchen to the counter while we have been focussing our main attention on the volume business in the kitchen—with the result that, although single voices and single-handed action have attempted to follow the trend, as an industry we have not really turned a hand to get this business." Mr. Stern feels that our market surveys have been inadequate, and asked for a show of hands to prove how few non-residential sales departments really know how many small and counter commercial appliances are on their lines and how many similar competitive units are in their territories. Said he, "No one in the industry knows exactly how big this field really is—but it is certainly enormous!"

Some 180 men from 23 states attended the Conference, held in the South for the first time since the inception of this annual feature in 1933. Sessions were presided over by Franklin T. Rainey, Chairman of the Section, H. Carl Wolf, Vice-Chairman of the Section, Charles W. Gale, Knoxville, Tenn., and Arthur M. Apmann, Derby, Conn. The Program Committee, chairmanned by Mr. Gale and consisting of Ted Bergman, Lakeland; F. F. Hamilton, Atlanta; Terry Hart, Nashville; J. C. Huskisson, Tampa; J. P. Leinroth, Newark; W. H. Ligon, Atlanta; C. D. Littlefield, Miami Beach; John F. Mooney, Orlando; J. W. Owen, Winter Haven; E. L. Stauffer, Charleston; Frank H. Trembly, Jr., Philadelphia; O. C. Warren, Birmingham, and Eugene D. Milener, Secretary, New York, provided, not only for the business features above reported, but arranged the open-air barbecue dinner and entertainment Thursday evening. The Ladies' Entertainment Committee, Mrs. H. Carl Wolf, Chairman, arranged for such interesting ladies' events as a bridge-luncheon and a "Gone-With-The-Wind" tour of historic and romantic Atlanta.

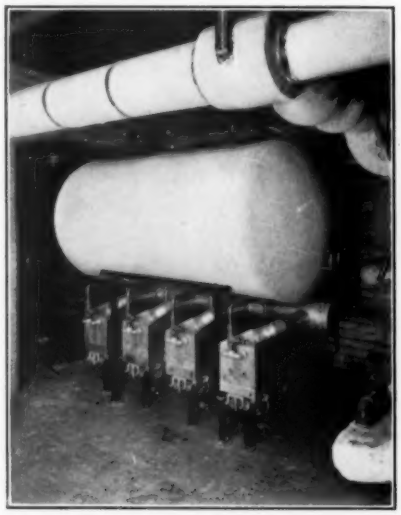
Exceptional 350 Gallon Water Heater Installation

An outstanding water heater installation was recently completed in the group of buildings of St. Mary's Church in New Haven, Conn. Hot water is supplied in large quantities to the rectory, a large kitchen in the auditorium located in the basement and for all other purposes, throughout the church property.

The heater was a regular factory-assembled job, made by American Bosch Corpn. of Springfield, Mass.

It consists of a 350-gallon copper tank to which were attached four Model WHB 75 B1 Konverto water heaters, each with an input of 38,000 b.t.u.'s and a recovery capacity of 53 gallons an hour, giving a total input of 150,000 b.t.u.'s and a recovery capacity of 212 gallons per hour of water heated 60 degrees in temperature.

The heaters are individually controlled, so that during periods of high demand, or during the winter months when the inlet water was extremely cold, all of the heaters could be operated. While during periods when not much water was being used, or when the inlet temperature was warm, one, two or three of the heaters could be shut off, permitting economy of operation with the assurance that plenty of hot water could be produced within a short time if necessary. Also the application of four units to the one tank prevents any interruption in hot water service through a failure of any one of the units.



350 Gallon Water Heater

The heaters are connected to the tank by means of an American Bosch dual circulator in which the hot and cold water are circulated to and from the tank through one tapping which makes for an extremely neat and practical installation. Operating cost of heaters of this kind has proven extremely low.

Dan Duncan, water heater supervisor of New Haven Gas Light Co., spent considerable time to bring this sale about, it being necessary to give special attention to many details.

Recommendations by satisfied users of smaller heaters of similar type, were also helpful in bringing about this sale. Gas won out against very keen oil and coal competition.

"Gas News" Wins Award

This monthly publication issued by Peoples Gas Light & Coke Co., of Chicago won the Midwest Regional Award for company magazines in the Better Copy Contest of the Public Utilities Advertising Association. This is the second award Gas News has won during the current year, the first being from the Industrial Editors' Association. Formal presentation of the award took place at the P. U. A. A. Convention on June 25 in Chicago.

A.G.A. Committee on National Defense

On May 29, Walter C. Beckjord, President of the American Gas Association and Alexander Forward, Managing Director, offered to the various departments of the United States government concerned with national defense the full support and cooperation of the gas industry.

The committee on national defense named by the Association is as follows:

George F. Mitchell (chairman) President, The Peoples Gas Light & Coke Co., Chicago, Ill.

E. R. Acker, President, Central Hudson Gas & Electric Corporation, Poughkeepsie, N. Y.

Frank L. Ball, New England Power Association, Boston, Mass.

B. R. Bay, President, Northern Natural Gas Company, Omaha, Neb.

C. E. Bennett, President, The Manufacturers Light & Heat Co., Pittsburgh, Pa.

N. B. Bertolette, President, Hartford Gas Company, Hartford, Conn.

E. H. Bird, Vice President, Eastern Gas & Fuel Associates, Boston, Mass.

A. F. Bridge, Vice President, Southern Counties Gas Co. of Calif., Los Angeles, Calif.

Floyd C. Brown, Vice President, Natural Gas Pipeline Company of America, Chicago, Ill.

J. A. Brown, Gas Engineer, The Commonwealth & Southern Corporation, New York.

C. M. Cohn, Executive Vice President, Consolidated Gas, Electric Light & Power Co., Baltimore, Md.

Frank L. Conrad, Vice President. Michigan Consolidated Gas Company, Detroit, Mich.

H. L. Farrar, President, Coast Counties Gas & Electric Company, San Francisco, Cal.

C. E. Gallagher, President. The East Ohio Gas Company, Cleveland, Ohio.

N. Henry Gellert, President, National Public Utilities Corp., Philadelphia, Pa.

J. H. Gill, President, Electric Bond & Share Company, New York.

E. L. Hall, Vice President, Portland Gas & Coke Co., Portland, Ore.

R. B. Harper, Vice President, The Peoples Gas Light and Coke Company, Chicago, Ill.

D. P. Hartson, Operating Manager, Equitable Gas Company, Pittsburgh, Pa.

G. S. Hawley, President, The Bridgeport Gas Light Co., Bridgeport, Conn.

William A. Jones, President, Cities Service Company, New York, N. Y.

F. L. Kruesi, President, Middle West Corporation, Chicago, Ill.

Conrad N. Lauer, President, Philadelphia Gas Works Company, Philadelphia, Pa.

F. H. Lerch, Jr., President, Gas Companies, Inc., New York.

George W. Lewis, Vice President, American Gas & Power Company, New York.

C. A. Lunn, Technical Director, Consolidated Edison Co. of New York, Inc., New York.

W. Cullen Morris, Vice President, Consolidated Edison Company of New York, Inc., New York.

N. C. McGowen, President, United Gas Pipe Line Company, Shreveport, La.

C. E. Paige, President, The Brooklyn Union Gas Company, Brooklyn, N. Y.

A. B. Paterson, President, New Orleans Public Service Inc., New Orleans, La.

A. I. Phillips, Consulting Engineer, New York.

Ben F. Pickard, President, Interstate Power Company, Dubuque, Iowa.

C. P. Rather, President, Southern Natural Gas Company, Birmingham, Ala.

Herman Russell, President, Rochester Gas & Electric Corp., Rochester, N. Y.

F. J. Rutledge, Vice President, The United Gas Improvement Co., Phila., Pa.

Elmer F. Schmidt, Vice President, Lone Star Gas Company, Dallas, Texas.

N. T. Sellman, Assistant Vice President, Consolidated Edison Company of New York, Inc.

M. L. Sperry, President, Washington Gas Light Company, Washington, D. C.

H. R. Sterrett, President, New Haven Gas Light Co., New Haven, Conn.

T. J. Strickler, Vice President, Kansas City Gas Company, Kansas City, Mo.

Paul R. Taylor, Vice President, Consolidated Electric & Gas Co., New York.

E. L. White, Secy-Treas., Laclede Gas Light Company, St. Louis, Mo.

L. J. Willien, Chief Gas Engineer, Public Utility Engineering & Service Corp., Chicago, Ill.

P. S. Young, Chairman of Executive Committee, Public Service Electric & Gas Co., Newark, N. J.

Walter C. Beckjord, (Ex Officio) President, American Gas Association, New York.

A. Gordon King, (Secretary) Service Engineer, American Gas Association, New York.

Obituary

HUGH WADE HARTMAN

Hugh Wade Hartman, Assistant Manager of the American Gas Association and Secretary of the Association's Accounting and Technical Sections, died suddenly Saturday, June 8, of a heart attack at his home in Yonkers, N. Y. His age was 53.

Mr. Hartman enjoyed the distinction of being the oldest member of the Association's headquarters staff in New York in point of service. In fact, his work with a national association serving the gas industry antedates the organization of the American Gas Association. He was employed as assistant secretary of the old American Gas Institute, which in 1918 combined with the National Commercial Gas Association to form the American Gas Association.

Mr. Hartman became affiliated with the gas industry in the collection department of The Peoples Gas Light and Coke Company, Chicago, in 1906. In 1908 he became secretary to the engineer of distribution and, in 1910, was made secretary to the chief engineer of the same company.

His first trade association connection began in 1915 when he was appointed assistant secretary of the American Gas Institute. He continued with the Institute until the organization of the American Gas Association in 1918 when he was appointed secretary of the Technical Section of the newly formed association. He was appointed secretary of the Accounting Section in 1919. He advanced to the position of assistant secretary-manager in 1925, retaining the duties of secretary of both the Accounting and Technical Sections. Subsequently he assumed the additional duties of assistant manager of the Association.

Under Mr. Hartman's direction the Accounting and Technical Sections have shown extraordinary growth and development, and have been credited with many outstanding achievements.

OSCAR L. MOORE

Oscar L. Moore, retired Southern California Gas Company executive, died in Los Angeles on June 4 at the age of 58. Mr. Moore was a former member of the Los Angeles Gas and Electric Corporation, serving for many years as manager of the customers department in that organization. At the time of his retirement in 1939 he had a record of 35 years' continuous service in the utility business in Los Angeles.

New Equipment and Appliances

Republic Gradient-Heet Control

Autogas Company, 2258 Diversey Parkway, Chicago, announces modulated heating through the Republic Gradient-Heet Control which is now standard equipment on Republic Conversion Burners.

With Gradient-Heet Control the gas input to the Republic Burner is normally maintained at a low stage—adjustable to suit the installation—as long as the room temperature is between a high and a low limit. If the room temperature decreases to the low limit the Gradient-Heet Control increases the gas input and sustains this higher input until the room temperature rises o fraction of a degree. Should the room temperature ever reach the high limit the gas input is shut off completely.

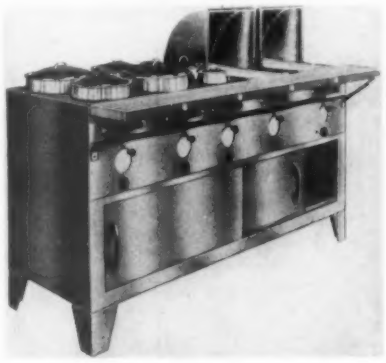
With Gradient-Heet Control the heat input is continuous except in mild weather. This results in increased comfort since the chances for stratification and over-shooting are minimized.

The Republic Gradient-Heet Control is extremely simple in design and construction and permits the unaltered use of the same thermostats and control valves that have been standard equipment with Republic in the past.

Waterless Gas Heated Storage and Serving Tables

Answering the increasing demand for gas heated waterless hot food tables, Ershler & Krukin, Inc., Bayonne, N. J., have developed a new line of units.

Two series, A and B, each having distinctive features embody important new developments which replace the old water bath with gas heated wells.



Serving Table, Series A

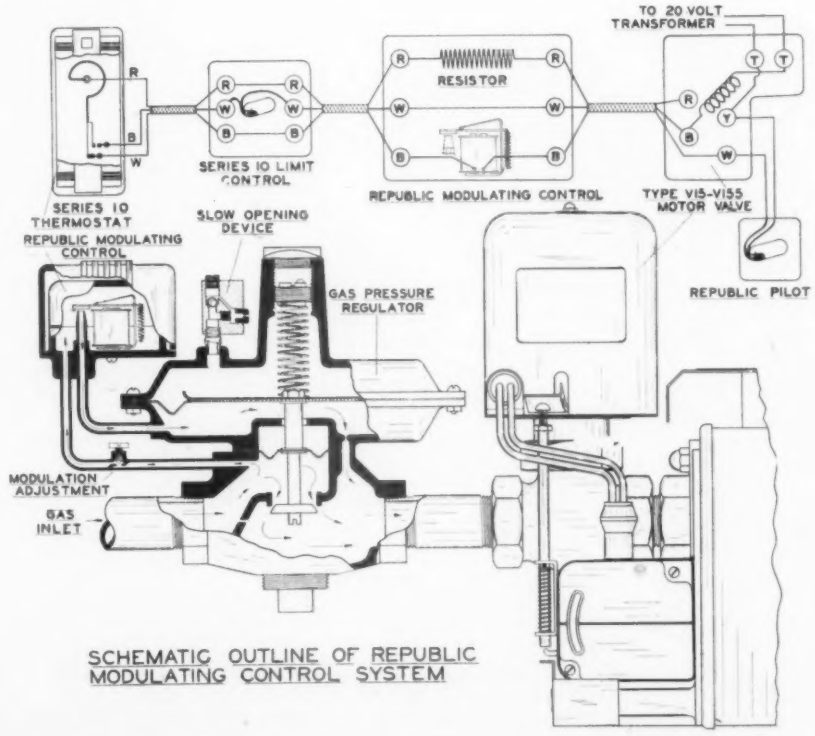
The wells of these units are made of heavy gauge rust-resisting metals and heat quickly when the gas is lighted. Water and waste connections are eliminated and it is said these units save 30% to 50% in fuel costs.

The series A serving tables have individual burners for each section, each burner being equipped with its own pilot and indicating valve. Because of this construction, each section can be operated independently. Selected temperatures, therefore, for various foods can be easily and economically maintained.

Series B is also gas heated. This series consists of a one-section unit arranged to heat all food insets evenly. It is equipped with a series of gas burners fitted with individual pilots. All burners are controlled by one adjustable indicating valve. Both series can be equipped with thermostatic controls, which increase operating efficiency as well as economy of operation.

Series A is available in six standard models, varying in size from 46 inches long and 31 inches wide to 75 inches long and 33 inches wide.

The series B consists of 12 standard widths in size from 30 inches long and 26 inches wide to 70 inches long and 31 inches wide. Both series are available in Duco finish or polished stainless steel, open stands, semi-enclosed bases or totally enclosed with sliding doors and in special sizes, layouts and finishes made to specifications.



SCHEMATIC OUTLINE OF REPUBLIC MODULATING CONTROL SYSTEM

Sullivan Spaders

Sullivan M-2 spaders are built for tough jobs, including shaft sinking, tunnel and trench work, and also light demolition. They are easy on the operator. Handle grips fit the hand, an air cushion at the end of the cylinder relieves jar, and exhaust ports are arranged to deflect exhaust away from the operator. They are easy to dismantle.

They are ruggedly constructed with strong, well protected joint connection to maintain perfect alignment and a special heat-treated steel retainer to resist wear from the spade.

Described in Bulletin 87-K—Sullivan Machinery Company, Michigan City, Indiana.

TITAN WATER HEATER CONTROLS

AGA Approved
TITAN Temperature and Pressure Relief Valve

This device is installed on the hot water outlet in the tank directly in the flow of water. Action, as a result, is unfailing and positive, there being no dead pockets to prevent proper functioning of relief valve.

Pressure relief is obtained through a spring-loaded valve which opens when the pressure reaches a predetermined point. Should the water become overheated to 200° F, a fusible disc melts and lets the water escape thereby preventing a further increase in temperature.

The Titan Relief Valve serves as a coupling connected in the line thereby eliminating the necessity and expense of a tee fitting. To replace fusible disc, it is not necessary to disassemble valves or piping in any way.

Design for application to storage or range boilers. Prevents corrosion, scalding and explosion.

Catalog and full information upon request.

The Titan Valve & Manufacturing Company

Thermostats • Safety Pilots • Relief Valves • Safetystats
9913 Elk Avenue Cleveland, Ohio

All sizes up to 3,400 cu. ft. capacity

Meters
Diaphragms
Repairs
Provers
Pumps
Calorimeters
Wet Meters
Gauges
Apparatus

METER REPAIR PARTS
FOR
ALL MAKES — ALL SIZES OF METERS

LARGEST GAS COMPANIES NOW USING OUR PARTS

SEND FOR OUR CIRCULAR ON METER REPAIR PARTS

SAMPLES AND PRICES GLADLY SENT

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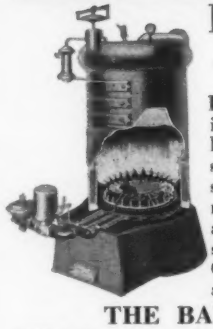
LAMBERT METER CO.
PLAINFIELD, NEW JERSEY

GAS SERVICE STOPS

SINCE 1869 Hays has built dependable brass products for the Gas Industry. Standard, Special Weight, Heavy Pattern and High Pressure Stops to meet all requirements are manufactured by Hays in a full range of sizes. Write for Catalog No. 4 today.

HAYS MANUFACTURING CO. ERIE, PA.



Famous for Heating Satisfaction

Leading gas equipment dealers and heating contractors prefer Barber Conversion Burners because they mean *permanent* sales, and freedom from trouble and servicing. A wide range of sizes for both round and oblong furnaces and boilers, all properly adjustable to grate dimensions. Write for catalog and price list on Conversion Burners, Appliance Burners and Regulators.

THE BARBER GAS BURNER CO.
3704 Superior Ave. Cleveland, Ohio

BARBER *Automatic* JET GAS BURNERS

SEMET-SOLVAY ENGINEERING CORPORATION

Blue Gas Plants
Water Gas Machines
Washer Coolers
Naphthalene Scrubbers
Gas Purifiers
Condensers
Waste Heat Boilers
Producer Gas Plants

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HOTEL CHELSEA

FROM $6 WITH MEALS & BATH
$3 ROOM ONLY & BATH
Per Person 2 in a Room Less Weekly

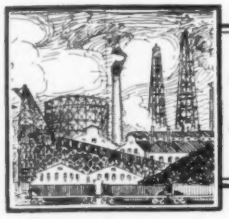
RIGHT ON THE BOARDWALK

Here you will find everything to further your comfort and enjoyment — outside ocean-view rooms . . . sun deck . . . beautiful dining room at the ocean's edge . . . superb cuisine . . . varied sports . . . and entertainment. You'll like your fellow guests . . . and the delightfully friendly atmosphere of The Chelsea.

SPECIAL WEEKLY RATES
WRITE FOR BOOKLET AND INFORMATION

ATLANTIC CITY

JOEL HILLMAN · J. CHRISTIAN MYERS · JULIAN A. HILLMAN



News of the Gas Industry

Appalachian Meter School Proceedings Published — Third Annual Meeting Announced for August 19, 20 and 21, 1940

The Proceedings of the Second Annual Appalachian Gas Measurement Short Course have been printed in book form and have now been distributed to all who were registered at the 1939 meeting.

This second meeting of this school, jointly sponsored by the University of West Virginia, was held in Morgantown last August, with H. J. Wagner

Ray W. Hitchman, Chairman

of the Commission serving as Chairman of the Meter School Committee. Over 400 gas men from the Eastern United States attended.

The dates for the third meeting of this school, which will be conducted under the chairmanship of Mr. Ray W. Hitchman, Superintendent of Gas Measurement for the United Fuel Gas Company of Charleston, have been announced as August 19, 20 and 21, 1940.

Mr. Hitchman and his committee workers are now developing the program in which nationally known authorities in the gas industry will participate. Announcement cards listing the activities will be released in July. It is expected that the enthusiastic reports of those attending previous schools will induce many others to come to this instructive meeting.

The Proceedings of the 1939 School Cover papers read and discussed on the general theme "The theory and Practice of the Measurement and Control of Gases." It is a paper cover, bound volume of 478 pages containing many photographs, charts, curves and diagrams making the text interesting and easy to follow.

A limited number of extra copies are available which can be obtained by addressing Mr. G. R. Spindler, Director of the School at West Virginia University, Morgantown, West Virginia.

Wollenberger Appointed District Manager at El Centro, Calif.

H. L. Farrar, president of Coast Counties Gas and Electric Company, announces the appointment of Louis Wollenberger of Santa Cruz, Calif., as district manager of the Imperial Valley division with headquarters in El Centro. Mr. Wollenberger succeeds E. B. Mason, Jr., who will assume the position of traveling auditor with headquarters at Santa Cruz.

Mr. Wollenberger is a graduate of the University of Michigan. He began his career in the gas industry in 1927, with the Southern California Gas Company. In July, 1930, he joined Coast Counties Gas and Electric Company as measurement engineer. He has been in charge of industrial gas utilization and sales since 1933.

CONVENTION CALENDAR

July

3-5 *Canadian Gas Association.* Annual Convention, Jasper Park Lodge, Alberta, Canada. Northwest Conference of Pacific Gas Association will hold joint sessions.

8-10 *Michigan Gas Assn.*, Grand Hotel, Mackinac Island, Michigan.

August

19-21 *Appalachian Gas Measurement Short Course*, Morgantown, W. Va.

September

18-20 *Pacific Coast Gas Assn.* Annual Convention, Hotel del Coronado, Coronado, Calif.

26-27 *Empire State Gas & Electric Assn.*, Annual Convention, Westchester County Club, Rye, N. Y.

October

7-11 *American Gas Assn.* Twenty-second Annual Convention, Atlantic City, N. J.

Engineering Degree Conferred on Pres. Blackwell of Cincinnati Gas & Electric Co.

Hubert C. Blackwell, president of the Cincinnati Gas & Electric Company, received the honorary degree of doctor of engineering June 9 at the sixty-sixth annual commencement exercises of Purdue University, Lafayette, Indiana.

Mr. Blackwell was graduated from Purdue in 1902. His career has taken him to Pittsburgh, New York City, Davenport, Iowa; Kansas City and, in 1924, to Cincinnati.

Hubert C. Blackwell

The citation for his diploma reads as follows: "Engineer and executive whose talented energy has been devoted to the construction, operation and administration of public utilities and to the solution of the problems of human relations in industry."

Short Course on Condensate Recovery and Recycling

On Friday, May 31, 1940 at the Texas College of Arts and Industries, Kingsville, Texas, an organization meeting was called to lay plans for a short course in "Condensate Recovery and Recycling Operations." In addition to President J. O. Loftin, Dean J. E. Conner, and members of the Engineering Faculty, were others interested in the proposed course, representing the Industry.

It was decided to formulate plans for an annual short course to be held at the college in the Fall. The following committee was appointed to arrange the

initial program for the 1940 course.

R. L. Peurifoy	Kingsville, Temporary Chairman
E. E. Deback	Corpus Christi
E. V. Foran	San Antonio
C. H. Gee	Bishop
Jack Winters	Baytown
F. H. Dotterweich	Kingsville

Suggestions relative to the outstanding problems of interest in this work will be welcomed by the Committee which expects to complete the initial program in the near future. Correspondence should be addressed to Dr. Frank H. Dotterweich, Texas College of Arts and Industries, Kingsville, Texas.

Laboratories Listing Symbol Trade-Marked

The United States Patent Office on May 18, 1940, granted application of the American Gas Association for trade-mark registration of its Laboratories Listing Symbol. This emblem is employed for designating gas appliance accessories which comply with applicable American Standard Listing Requirements. The significance of this symbol naturally is materially enhanced by the granting of this trade-mark. The action taken supplements trade-marking, somewhat over a year ago, of the Laboratories Approval Seal which is employed to designate gas appliances complying with respective American Standard Approval Requirements.

A.G.A. Laboratories Listing Symbol

The newly trade-marked Laboratories Listing Symbol is shown in the accompanying illustration. As will be readily apparent its design incorporates the initial letters of the American Gas Association in a distinctive manner. This symbol has been available for some time as an alternate or optional marking which could be used if desired in place of the letters "A.G.A." which formed the emblem initially employed. In order to facilitate trade-marking and to incorporate a more distinctive design, the new symbol was designed and adopted for marking of certified accessories.

WINNERS IN THE DOMINION-REPUBLIC SPEAKING CONTEST

Standing L to R. C. Judd—G. Bauslaugh—C. Radebaugh—R. Pendleton—F. Strebe—R. Page. Seated L to R: J. C. Elliott—R. Miller (Honorable Mention)—H. Schrader—R. Read (First)—W. Elliott

Dominion-Republic Speaking Contest

The final Dominion-Republic Employee Speaking Contest, a part of the "Employee Development and Training Program" of the Republic Light, Heat & Power Co., Buffalo, N. Y., sponsored by S. B. Severson, Vice-President and General Manager of the company, was held at Hotel Lenox, Buffalo, June 14, 1940.

Over 120 employees representing all phases of gas company operations took part in the Divisional Elimination Contests. The ten finalists spoke on the subject *"How Can I Do a Better Customer Relations Job?"* This contest gave the employees an opportunity to speak before a group and to express their thoughts on their own job, its relation to the company operations and personnel and how all these factors could be used by them to make friends for the gas industry and promote better customer relations.

Robert L. Read, bookkeeper from the Niagara Falls, N. Y., office, won first place over nine other contestants. The winner will receive a trip to New York City and the Fair. Robert I. Miller, office boy of the Buffalo office, received honorable mention.

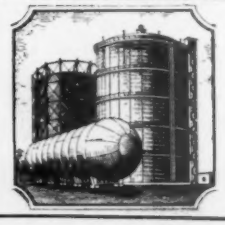
Judges for the contest were Dr. Lewis Froman, Dean of Millard Fillmore College, University of Buffalo; Mr. Jacob D. von Maur, Chairman, Manufactured Gas Section, Canadian Gas Association; and Mr. Norman D. Plummer, Division Traffic Supervisor, New York Telephone Company.

As chairman of the meeting and sponsor of the contest, Mr. S. B. Severson, Vice-President and General Manager, stated that the large participation by so many employees in diversified jobs clearly demonstrated the interest the employee has in improving customer relations. He recommended this contest as a means of finding out what the employee thinks about these things and another way to find hidden talent in the form of employees with speaking personalities, an asset to any company.

Beecher Named Gas Engineer

D. B. Beecher, former assistant to the valuation engineer of the gas companies identified with the Philadelphia Company of Pittsburgh, has been appointed to the newly created position of Gas Engineer.

Mr. Beecher has held various positions in the operating departments, principally as Superintendent of Gas Measurement and as Distribution Engineer. For the past two and one-half years he has been assigned to the reclassification of Gas and Electric Properties Department as assistant to the valuation engineer, working on gas properties of the Equitable Gas Company, Pittsburgh and West Virginia Gas Company, and the Kentucky and West Virginia Gas Company.



STACEY BROTHERS
Gas Construction Co., Inc.
"STACEY-KLONNE" & TELESCOPIC GAS HOLDERS
"STACEY BULLET" PRESSURE HOLDERS
PURIFIERS AND STEEL PLATE CONSTRUCTION
Executive Offices: Cincinnati, Ohio
Eastern Office 21 West St., N. Y. C.

Radio Programs from "Gas Wonderland"

A complete radio broadcasting station presenting daily programs, the studio of which is open free to the public, began operations during the week of June 10th at the New York World's Fair.

The studio is located in the air-conditioned theatre at the Court of Flame. It is a joint project of the New York Broadcasting System, operators of station WINS and its nine affiliated stations, and Gas Exhibits, Inc. The public will be admitted to the daily programs.

Hugh H. Cuthrell at WINS Broadcast

The schedule of broadcasts calls for a minimum of six daily shows comprised of quarter-hour and half-hour length.

Broadway and radio stage stars turned out in numbers on June 13 for the formal opening of the studios.

The ceremonies began at nine p.m. with the broadcasting of the popular program "Gold Mines in the Sky." Hugh H. Cuthrell, president of Gas Exhibits, Inc., expressed in behalf of his exhibit and the Fair, appreciation to Major E. M. Stoer, president of the network and to his organization.

Headlining the brilliant array of guest talent were such Broadway and radio stars as Willie Howard, Franchot Tone, Burgess Meredith, Doris Rhodes, Fields and Hall, Ruth Clayton, Patricia Brent, Rosita Royce and Jenny Lynn.

Scattered throughout the audience were prominent executives of America's gas industries, World's Fair officials, and hundreds of Fair visitors.

M. T. Chandler Elected Secretary of Consolidated Edison Co.

Announcement has been made by Consolidated Edison Company of New York, Inc., that Melville T. Chandler had been elected secretary, effective July 1. He will succeed Frederick W. Jesser, who retires at the end of this month with more than fifty-one years of service to his credit—the dean of all company employees in the electric side of the business.

Mr. Chandler was hired as an office boy by the United Electric Light and Power Company, one of the predecessors of Consolidated Edison Company, in 1915. He served as a clerk in the Engineering Department and a draftsman until he entered the war. In 1919, he returned to the Engineering Department and three years later became head of the Statistical Department. In 1930 he was made assistant secretary, and the next year became secretary. When the United was consolidated with The New York Edison Company, he became assistant secretary of the latter company, and when that in turn was merged into Consolidated Edison in 1936, he was made assistant secretary of the new company and manager of the General Office Service Department.

Irwin Rawson Joins Utilities Engineering and Construction Co.

Irwin Rawson, connected with the Stacey Manufacturing Co., Cincinnati, Ohio, for a number of years and also the Russell Engineering Co., St. Louis, Mo., has recently joined J. R. Ausnow, who for many years was connected with the leading gas holder construction companies as erecting superintendent and is now operating as the Utilities Engineering and Construction Co., with headquarters at 707 E. Lexington Ave., High Point, N. C.

The Utilities Engineering and Construction Co. specializes in gas holder construction, repairs, rebuilding, and maintenance throughout the Southeastern States.

Henry L. O'Brien Utility Officer

Henry L. O'Brien, who was elected first vice-president of Cities Service Corporation on May 16th was formerly senior partner of the law firm of Burns, O'Brien & Ruch. He also was made a director and a member of the executive committee. On June 20th he was elected a director of Arkansas Natural Gas Corporation, at the annual meeting, succeeding the late Henry L. Doherty.

William A. Hudson Named Domestic Sales Manager

William A. Hudson, formerly manager of the househeating-waterheating division of the Domestic Sales Department of Laclede Gas Light Co. was named Domestic Sales Manager on May 18.

Mr. Hudson joined the Laclede sales organization last Fall, having come from Houston, Tex., where he was general sales manager of the Houston division of the United Gas Corporation. He succeeds George H. Schlatter who resigned in May.

The sales organization under the direction of Mr. Hudson will continue intact, with John A. Steinson as senior supervisor of househeating-waterheating divisions, personally directing the southern district, assisted by James F. Gorman who will supervise the central division, and Joe C. Weddell, supervisor of the northern division.

REED'S 4 WHEEL
Razor Blade Pipe Cutters

IDEAL FOR ANY TRENCH OR OTHER CLOSE QUARTER JOBS

$4.20 F. O. B. ERIE

Capacity
½" to 2"
Weight 5 lbs.

The REED FOUR WHEEL Cutter operates with a short back and forth motion through only one third of a circle. Each of the four wheels exerts the same pressure on the pipe, and all 4 therefore cut evenly and completely through the pipe at the same time.

Equipped with Reed special alloy RAZOR BLADE Wheels, which cut with remarkable ease, leave little burr, and have a long life of useful service.

A sample cutter for test and trial may be ordered on memorandum invoice, to be paid for if retained or returned for credit if unsatisfactory. Try it once, and you will use no other.

REED MFG. COMPANY
1436 W. 8th Street • ERIE, PA.

Harper-Wyman Company Appoints Henke Sales Manager

Advancement of Frank Henke to the position of Sales Manager is announced by the Harper-Wyman Company, of Chicago, makers of the Harper Burner System for gas range top burners.

Frank Henke

Following his graduation from Armour Institute of Technology, in 1935, Mr. Henke became associated with the firm in an engineering capacity. In 1937, he entered the sales department, becoming assistant sales manager before being promoted to his new post. He has a wide acquaintance in the utility and range manufacturing fields.

Blaw-Knox Bulk Plants for Handling Liquefied Gases

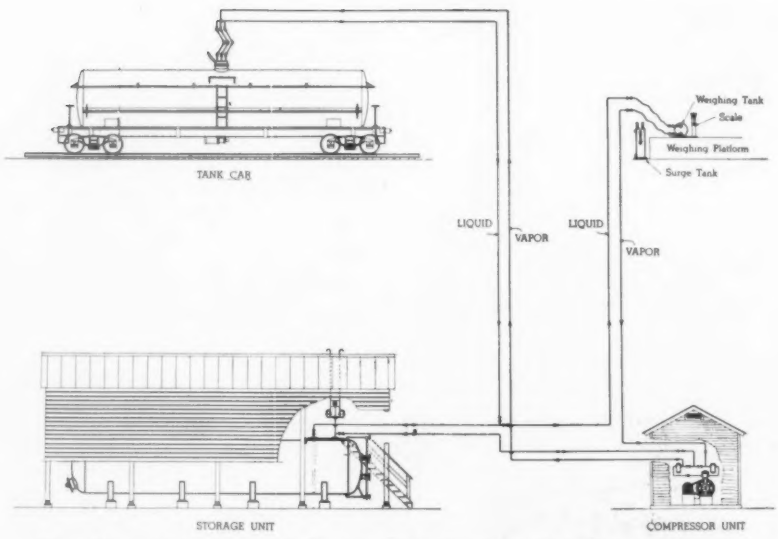
Purchase savings and handling economy for the users of anhydrous ammonia, butane, carbon dioxide, chlorine, propane, and other hydrocarbons and liquefied gases are the objectives of the development by Blaw-Knox Company, Pittsburgh, Pa., of a complete line of bulk plants for the unloading and storage of liquefied gases.

The engineering facilities and special equipment required for the handling, storage and unloading of high pressure liquefied gas has held back the installation of bulk plants by individual consumers. There is, however, no more difficulty in using gas from a properly designed and fabricated bulk plant than from small containers. The company will therefore design and fabricate, and, if desired, erect and place in operation unloading and storage plants for any of the commonly used liquefied gases. Blaw-Knox will also furnish some form of housing, such as the standard all-steel weather-tight building, to shield equipment handling the higher vapor pressure materials.

Storage tanks are checked by Hartford Steam Boiler Inspection and Insurance Company and National Board as complying not only with the National A.S.M.E. Code but with that of the particular State in which the vessel is to be used. After fabrication, all vessels are stress relieved in one piece.

Valves and piping are designed for the particular gas being handled. The piping for propane, for example, is made from heavy steel with special plug type valves. Special safety features are built into the equipment to meet emergency considerations.

The equipment is described and illustrated in the company's catalog, No. 1739, which also lists the thermodynamic properties of several gases.



Blaw-Knox Unloading and Storage Plant for Liquefied Gases as Applied to the Unloading of Ammonia.

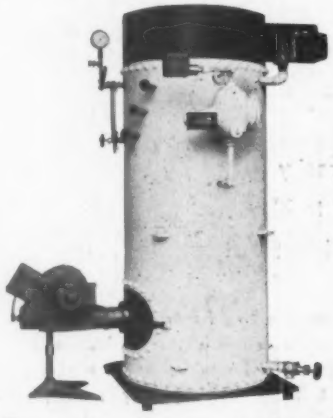
New Nordstrom Valve Price List

A new 48-page condensed price list, Bulletin V-109, covering all types and sizes of Nordstrom valves has just been issued by Merco Nordstrom Valve Company.

A comprehensive pressure rating index by metals to Nordstrom valve bulletins is included in the forepart of this bulletin. By referring to this index, quick determination of the proper valve figure number to meet various conditions of pressure, pipe size, connections and method of operation can be found. This index also lists the bulletin number and page on which each figure number is cataloged.

Copies of this price list can be obtained by addressing Merco Nordstrom Valve Company, 400 N. Lexington Avenue, Pittsburgh, Penn.

LATTNER
GAS — OIL BOILER
3 HP to 35 HP.



Burns natural gas or regular furnace oils with equal efficiency.

P. M. Lattner Mfg. Company
Cedar Rapids, Iowa

Proposed New Pipe Line

Independent Natural Gas Co. has filed application with the Federal Power Commission to construct an 877-mile natural gas pipe line, estimated to cost $28,698,000.

The pipe line is to extend from Sherman County in the Texas Panhandle to Milwaukee, the gas to be sold at wholesale to distributors serving markets at Milwaukee and vicinity.

It would cross the pipe-line systems of Northern Natural Gas Co., Panhandle Eastern Pipe Line Co., Natural Gas Pipe Line Co. of America, and Cities Service Gas Co., and would also cross areas now being served with natural gas by some of these gas companies.

The proposed line would extend across parts of the states of Texas, Oklahoma, Kansas, Missouri, Iowa, Illinois and Wisconsin, with laterals connecting with the facilities of distribution companies and industrial consumers.

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Illinois Cities Swing to Natural Gas

The Illinois Gas Company operating in the towns of Lawrenceville, Bridgeport, Sumner and Olney, Ill., announces a change-over from manufactured gas of 700 B.t.u. content, to 950 B.t.u. natural gas, the latter being now furnished by the Kentucky Natural Gas Corporation of Owensboro, Ky.

In abandoning the pumping station of the former system, The Illinois Gas Company will dispose of the compressors and other equipment for which there is now no further need.

Southern California Gas Co. Changes in Personnel

Announcement of a change in the office of treasurer and in certain personnel under the supervision of E. N. Simmons, controller of the Southern California Gas Company, has been made by F. S. Wade, president of the company.

The new appointments, effective July 1, 1940, are as follows: L. D. Romig, treasurer, will become assistant controller in charge of tax and pension matters. G. A. Detrick, formerly general auditor, assumes the duties of treasurer. S. W. Binckley, assistant rate and appraisal engineer, becomes assistant to the controller; and A. B. Cates, Jr., takes over the position of general auditor.

Mr. Simmons has been controller of the company since the merger of the Southern California Gas Company and Los Angeles Gas and Electric Corporation in May, 1937, prior to which time he had been auditor of the Los Angeles Gas and Electric Corporation for many years.

Pacific Lighting Corporation

Election of C. O. G. Miller, for 42 years president of Pacific Lighting Corporation, to the position of chairman of the board, and election of Robert W. Miller, to succeed him in the presidency, was announced recently after a meeting of the directors.

Compressor Units For Sale

Due to change-over in our properties from manufactured to natural gas, we offer for sale the following gas driven Compressor Units at attractive figures.

Two 80 H.P. Cooper-Bessemer engines, with compressors 14″ x 20″ and 7½″ x 20″.

One 2XVG Ingersoll-Rand engine with 15″ x 12″ compressor (new in 1939).

One Climax engine with 10″ x 8″ Ingersoll compressor. V-belt driven.

One John Deere W113 engine with 9″ x 8″ Ingersoll compressor. V-belt driven.

All are in good operating condition. For further details, delivery and price, address:—

The Illinois Gas Co., Lawrenceville, Ill.

ALFRED I. PHILLIPS

CONSULTING ENGINEER

Rate Developments — Valuations

Reports — Design

Management

53 PARK PLACE — NEW YORK

Gas For All Four

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metal cast into the frame of the building when the concrete was poured. The considerable condensation incidental to a stack 70 feet high was eliminated by the installation of a copper tube (with drip cap) off the butt of the vent to the outside wall.

Ranges and Refrigeration

Each of the 63 smartly appointed apartments in the building is equipped with a modern, automatic O'Keefe and Merritt gas range and a current model Servel Electrolux gas refrigerator. The ranges are full sized, with four top burners and a large oven and broiler. Ovens are heavily insulated and possess automatic controls and full automatic lighting.

Summarizing the reasons why natural gas was chosen for the major service jobs in the Shangri-La, Manager Green said:

"In selecting natural gas for the Shangri-La the management recognized the ability of this clean, efficient and flexible fuel to meet the highly specialized and exacting demands of the class of tenants who would occupy this apartment hotel. We have attempted to equip the apartments with every sort of modern convenience for home life, and consequently we have furnished each kitchen with large up-to-date gas ranges and gas refrigerators, which were chosen both for their beauty of design and for their convenience and practicability. In the selection of room heating equipment we have been especially careful to secure the kind of unobtrusive, easily operated and trouble-free appliance that we know the guests will require. We feel sure they will find the gas furnaces equal to every requirement."

The general contractor was Tulsa-Santa Monica Corporation. Bathroom radiators and gas-fired central heating plant for heating bathrooms installed by Ross Plumbing Co., Los Angeles. Fraser-Johnson gas heaters installed by Hartman Sheet Metal Co., Los Angeles. Room heaters installed by Andrews Heater Co., Los Angeles. Vent system for Andrews room heaters and Fraser-Johnson room heaters was designed and installed by Andrews Heater Co., engineering department. Gas refrigerators installed by Southern California Gas Co. Gas Ranges installed by O'Keefe & Merritt Co., Los Angeles.

Waterless Holder

(Continued from page 28)

counter. The maximum and minimum air temperatures for the day are also recorded as well as the gas temperatures at the holder inlet. At intervals, samples of the sealing tar are taken and sent to Chemical Laboratory for examination. These samples are taken at 1" below surface in tar cup, 1" below surface in tar dam and 2" above bottom in tar dam, and also from skimmer tank. The results found by the chemist will determine whether it is necessary to start or stop conditioners, or to operate heaters or anti-freezers on dam. Any free water in skimmer tank is to be skimmed.

Maintenance of Waterless Holder

Grease rollers once per year. Grease tar pumps and motors monthly. Change tar pump gear oil, twice a year. For winter operations use 20 W motor oil, and summer operation SAE 50 motor oil. Change gear case oil in inside elevator twice a year. Change oil in outside elevator gear case twice a year. Make monthly inspection of all the mechanism and hoisting ropes. Inspect cables for broken strands. Oil all moving parts where oil holes are provided once a month, and once a year, operate and test outside car safety. Once a year, operate and test inside car centrifugal brake safety. Inspect the conditions of the elevator rails, solenoid brake and freeness of car safety.

Book Review

Fuel Flue Gases. Published by American Gas Association, New York. 198 pages 8½" x 11". Price $5.00 per copy to non-members; $2.50 per copy to members. Special quantity prices.

This is an exhaustive and valuable reference book covering the basic laws, analysis, constituents, properties, handling and uses of gases.

In addition to the introduction, the book is divided into nine chapters. The first five chapters deal largely with fuel gases, the sixth chapter with the chemistry of the distribution system and its problems, and the seventh chapter with atmospheres other than those composed of combustion products. The last two chapters deal particularly with gases which result from the combustion of industrial fuels and fuel gases. Chapter VIII relates to the chemical interpretation of the relatively new field of furnace atmospheres. It indicates the growing importance and usefulness of the chemical side of the gas business, and although it may not contribute much which is new to the science of furnace atmospheres, it should draw attention to a new phase in the gas business, namely, gas as a chemical and not a heat agent. The final chapter deals with the interpretation of the flue gas analysis itself. As far as has been possible, the text is provided with concrete practical examples illustrating the procedures which may be followed.

We recommend this book to all members of the gas industry who are concerned with the technical phases of gas utilization.

Brooklyn Union Gas Company Pays Tribute to E. C. Uhlig

Edward C. Uhlig, Chief Chemist and head of the Brooklyn Union Gas Co. Laboratory since its inception in 1904, was honored on June 11th at a dinner held in commemoration of his retirement from active service.

Two hundred of his closer friends in the company and industry were present including many company officers and friends employed by other utilities.

His employment with Brooklyn Union marked the beginning of the Laboratory, which in the past 36 years has grown until today the staff numbers 40 men. Under his direction the Laboratory has made many important contributions, both to the company and to the gas industry as a whole.

Four speakers joined in expressing appreciation of the many contributions which Mr. Uhlig has made to the company and industry, of his long years of faithful service, his qualities as a man. The speakers were Vice Presidents B. G. Neilson and Hugh H. Cuthrell, Charles A. Lunn, technical director of the Consolidated Edison Company of New York, and Laurence G. Gorman, president of the Gas Club. Edward J. Murphy, Assistant Chief Chemist, was toastmaster.

Mr. Uhlig is a member of many professional and industrial organizations, including the American Gas Association, American Chemical Society, American Society for Testing Materials, American Association for the Advancement of Science, American Institute of Chemists, Society of Chemical Industry of London, England, Society of Gas Lighting and the Chemists Club. For three years he was chairman of A.G.A. chemical committee. During the World War he was in charge of toluol production in Brooklyn Union.

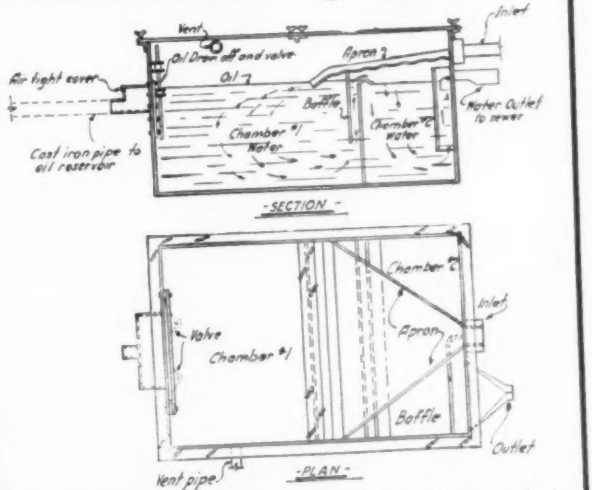
HUGHES PRINTING CO.
EAST STROUDSBURG, PA.

THE two C-F Low-Pressure Regulators with Automatic Cut-Off here seen, are on a gas line of a Texas refinery owned by one of the great oil-producing companies. Like all C-F low-pressure Regulators, they afford protection in case of failure of gas supply. Their merits include sturdy construction, sure precision, and long life as well as easy installation and maintenance. Write for new Catalog.

The CHAPLIN-FULTON MFG. CO.

28-40 PENN AVE. CF PITTSBURGH, PA.

For Treatment of Effluent



The Morse Separator enables the separation and recovery of tar and oils from your effluent. It clarifies to a point which satisfies local and federal regulations on pollution.

Separation is effected by passing the raw effluent over a riffle board which separates oils and tar and passes clarified effluent to sewer.

Handles large volumes with relatively small units. Continuous in operation. No moving parts. Small labor cost. Successfully used by outstanding gas and oil companies and many industrials.

Bulletin 301 sent on request.

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LESS OXIDE

REMOVES MORE H_2S

Because **LAVINO ACTIVATED OXIDES** are made *specifically* for maximum sulphur removal . . . are not "satisfactory" purifying mediums by virtue of incidental properties, but are made for maximum capacity and activity, maximum trace removal and shock resistance!

One of the following you'll find may save you much in handling—in trouble—in total costs:

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LAVINO ACTIVATED SLURRY. A new development in purifying materials, is shipped in steel drums . . . ready, with the addition of a small amount of water, to mix with any type carrier. Is used successfully also as a catalyst in liquid purification. Contains 50% (guaranteed minimum) to 55% Fe_2O_3; 25% to 30% moisture.

LAVINO ACTIVATED SPONGE is furnished ready mixed, carefully coated on large, tough, specially selected hardwood shavings.

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P ARTS INTERCHANGEABLE

R EDUCED OPERATING COSTS

A CCURACY IN REGISTRATION

G IVES SATISFACTORY SERVICE

U NIFORM PERFORMANCE

E FFICIENT AND DEPENDABLE IN MANUFACTURED, NATURAL AND BUTANE GASES

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